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Contents.

The Tariff and Business 287
Massachusetts as a Textile State 288
American Cotton Manufacturers' Association 290
Annual Address of Pres. T. H. Rennie 293
Cotton Waste Manufacture 293
Baling and Handling Cotton 296
Cotton Goods Tariff 298
Development of Foreign Cotton Goods Trade 299
Report of Committee on Cotton Exchanges 300
Southern Textile Association 301
In the Lobby 302
New Regulations of the New Orleans Cotton Exchange.305
Labor Legislation 306
National Association of Hosiery Underwear Manufacturers 307
Cotton Spinners of the World in Session 310
Making of a Thread 314
Plain Cloth 315
Sizing Compounds 316
Yarn Reels and Roving Scales 317
The Use of Cotton in the Woolen Mill 318
Advantages and Disadvantages of Steaming Woolen Yarns 319
Quadrant Mechanism for a Woolen Mule 320
Analyzing a Cut Balbriggan Undershirt 321
Rib Top Machine 323
Yarn Changer 325
Stop Mechanism for Re-inforcing Yarn 326
Chemicals used in the Textile Industry 327
Valuation of Property for Insurance and Adjustment of Fire Losses 326
From a Southern Bleacher and Finisher 329
Dyeing with Sulpherized Dyestuffs 330
Market Reviews 331
Textile Mill Situation in New England and the South ..333
New Machinery and Trade Notes 336

THE TARIFF AND BUSINESS.

The progress that has been made in tariff legislation since our last comments has been of little practical utility so far as actual results are concerned, though it must be assumed, if not apparent or tangible, that the end is nearer at hand to something fixed in the form of a law upon which business may calculate with some degree of confidence in determining its future operations. Most, if not essentially all, of the debates and speeches in the senate, before which the tariff bill has been for discussion, have been purely academical to gratify sectional interests or consumption, without much, if any, expectation of their being convincing enough to influence a single vote among the legislators, or, at most, having any vital affect on what has been predetermined by the majority of those having the bill in charge. The tariff, as a political or industrial tenet, is always fixed outside of congress, and whatever is done by the latter is confined to a legal foundation of the views of those interests mostly affected. Congress simply puts into shape the major sentiment of those representing the business affairs of the nation.

A tariff on imports never was enacted for the benefit of consumers, directly, but rather for the benefit of the industrial life of the nation, in the vitality and prosperity of which the consumers derive an enjoyment that always attends a healthy environment. A tariff is a business proposition, it is very largely a life-supporting element in industrial progress, and, moreover, it is a political measure upon which partisan views are based and find their stimulus for existence. It is impossible to take the tariff question out of party politics, for the latter had its being and inspiration in its discussion and necessity. Only in a few instances has any breaking away from party traditions been observed in the congress now in session in the advocacy of either high or low protection, and these derelictions in party principles have been entirely due to the claims made upon legislators by an influential constituency. Local issues are frequently potent elements in determining what should be a national policy affecting national needs and the conservation of national progress. This has been already observed in the congressional debates, in which local interests have dominated the action and speech of legislators toward the passage of some particular portion of the tariff bill.

The sole functions of a protective tariff on imports are to give to American manufacturers and producers a preferable position in the American markets, and a substantial degree of prosperity when the elements of pros perity prevail. They are inoperative to the extent of preventing periods of business depression, or of inhibiting reckless speculation with its disastrous results. Prices of commodities, as a rule, are not raised because of a tariff, more than enough to conform to a standard of living which Americans set for themselves, governed by a domestic competition which is always toward a lower level. If goods are made wholly abroad, then, of course, the rate of duty on the imports acts toward an enhancement

of values that would not prevail were there a domestic competition. It has been the subject of demonstration, time and time again, that the cost to the consumer of an article made in any considerable quantity in this country, is not enhanced to the amount of the duty on a competing article of foreign manufacture. Perhaps nothing shows this more correctly than in articles of hosiery, upon which interesting information may be obtained in other parts of this issue.

The business of the country has about come to the conclusion that the general tenor of the tariff bill now being debated will receive no material modifications in its final passage from what it is now, and what changes may be made will be those chiefly affecting its phraseology and administrative features, the latter possessing a number of phases of vital importance to manufacturing interests, of far more consequence in the present status of the bill than the rates of duty. This applies with particular cogency to the textile schedules, which may be affected more by the administration of the law and the conditions concerning the export and entry of goods for the American market. That the law will be amply protective in intent and in fact is so conclusive that no scheme of consequence, in the textile line, at least, is retarded by any lack of confidence in a propitious future as may be determined by current means of calculation. This is apparent in the incorporation of new mills and additions to mills already established, as noted in our columns devoted to information of this kind. There seems to be no hesitation on the part of capital to invest in textile manufacturing, both woolen and cotton, without fear of the domestic market being taken away or materially impaired by the introduction of foreign merchandise. In fact, we can not recall the time when greater confidence existed in the textile industry than the present, not only in its stability, so far as it may be affected by any tariff legislation, but in its remunerativeness as dependent on an active demand for its products due to the excellent financial condition of the people. We do not wish to be understood as claiming that trade conditions are as thriving as they should be, but we do claim that they are extremely promising and that prosperity is within tangible reach, and that capital believes it.

As already intimated, the administrative features of the tariff bill are the most perplexing, and upon which there is a greater genuine diversity of opinion than on any thing else. They are comparatively free from partisan prejudice or the taint of party politics. They, at least, are being considered in the light of their economic effect upon our commercial relations with foreign nations, and upon the equity of trade conformable to the intent of the laws in its relation to the importation of foreign products. The establishment of a customs court, a tariff commission, a tariff bureau, or anything else is of not so much consequence as is the character of those appointed to carry out its functions and not be cumbersome or usurp those of the legislative departments of the government. It would seem advisable for an equitable execution of a plan of maximum and minimum duties upon imports to establish a board of competent persons to study into the facts, and to advise a proper course of action that should be taken in applying the words and phrases of the law according to the designs of congress. The same sort of reasoning might be applicable to the establishment of a tariff commission, though with duties more in harmony with the needs of an auxiliary to congressional committees than has yet been devised. A commission of the kind so frequently suggested in conventions and by commercial bodies, should not be modeled after those of foreign countries because like administrative or executive conditions do not exist. European methods of government are not comparable with those of our own government, the former being obedient to a responsible ministry that initiates and advocates governmental policies before a presumably sympathetic parliamentary body for its acceptance, but in case they are not supported in their essential features the cabinet resigns or a dissolution of the legislative body follows with an election for a new parliament more in harmony, it may be, with the policies of ministry. In the United States the methods are different, in that the initiative is lodged in the legislative body, and in the house of representatives should it relate to revenue measures. A "responsible ministry" with functions of preparing measures for legislative action is unknown. Consequently the necessity or value of a commission of experts or of those versed in the scope and intricacies of the subject placed before them is not so apparent for our form of government as for those of European countries. Without considering the expediency or practical benefit of a commission or bureau to study commercial or industrial questions affecting a tariff on imports, and the advising of congress on the results of an investigation, it should be borne in mind that the political institutions of the United States are not comparable with those existing in Europe, and while we may learn with profit from the methods and ways of monarchies we should regulate our actions according to our own political text-books and customs, which are not generally favorable to the investiture of authority in a body of men to advise in legislation duties which have been intrusted to representatives of the popular will.

MASSACHUSETTS AS A TEXTILE STATE.

The geographical centralization of manufacturing industries is a subject to which attention is frequently drawn by the business man and the economist. The reason for this tendency of business interests grouping together is not always apparent upon first consideration, but that it has an incentive of some kind must be accepted as something real and not fictitious, as no important movement of mankind, in its commercial and industrial relations, can ever be regarded as being governed by fanciful and ephemeral conceptions: Movements may, at times appear inspired by some fugacious motive, but when they involve matters of material consequence they invariably are not entered upon without careful reflection on the issues that may take place. The reasons for the migration or the establishment of any industry in any particular locality are, we may repeat, not always apparent, at first, nor after the lapse of a considerable period of time when a retrospective view can be taken of the situation.

The point we desire to emphasize in this respect is the peculiar strong position occupied by Massachusetts as a textile manufacturing State, even in a section of the country that is conspicuously identified with this industry. In the decennial period ended in 1900 the increase in the number of spindles in Massachusetts was nearly 93 per cent. of that in the six New England States, and in the quinquennial period ended in 1905 the percentage of in-

crease was nearly 60. These are facts that must possess elements of importance, but how to define them or circumscribe them with economic significance is something difficult of determining in anything like general terms. There is nothing about the geographical position of this State, or any natural supremacy which it possesses over any other of the New England States, which should give it a preeminence for manufacturing purposes. There are more potent forces of an industrial nature that have been and are in operation in making the State great in its manufacturing activities than its water-powers for inducing the location of factories, for Maine and New Hampshire have equal advantages of this kind for building up manufacturing enterprises of like magnitude.

Broadly speaking, textile mill construction is planned for the New England States calling for an investment of twenty million dollars by thirty-seven corporations, and fully 80 per cent. of this amount is to be expended in Massachusetts, the largest enterprises being for the manufacture of wool, chiefly for worsted, but several for the manufacture of cotton, chiefly for the finer lines of product. No small individual establishments are thought of, for the day of such was long ago passed, and none can now hope for success unless highly capitalized and keenly organized, requiring the highest executive ability for its conduct; and, moreover, necessitating a class of employes trained, or subject to training, in the exacting demands of factory employment. Local environments have much to do with the establishment and success of textile manufacturing in New England, and Eastern Massachusetts in particular. There, we find capital familiar with this class of industry and with those who control its destinies, and there are factors which are particularly efficacious in directing the course that the finances of a community take. Intimacy and fellowship between capital and industry are the inviting force, the cohesive energy, that brings them together cogently and conclusively.

Within the years 1905 and 1907, the latest in which official statistics are available, the value of manufactured products in Massachusetts increased 21.38 per cent., or from $1,124,092,051 to $1,364,431,255. Of this latter amount, 14 per cent. should be credited to the manufactures of cotton, and 10 per cent. to the manufactures of wool. In addition to these, there are those specifically belonging to the production of carpeting, linen goods, knit goods, silk goods, and clothing, aggregating for the entire textile industry a value, per annum, of $412,732,000, over 30 per cent. of the total value of the manufactures, of all kinds, in the State. Thus it will be seen, the textile industries of this State contribute nearly a third to the annual industrial wealth of the commonwealth, —large, not only in proportion, but in absolute amount,— more than any other single trade, the nearest approach to it being that identified with the production of boots and shoes.

The manufacturing wealth of Massachusetts, and its remarkable progress, may be more immediately recognized when compared with that made in population. The percentage of increase in population for the seven years ended in 1907 was 11.24, while that in the value of manufactures was 45.23, and the most marked increase, in the latter respect, was in the great cotton manufacturing localities about Lowell, Fall River, and New Bedford. The significance of this progress in these three places is that it is applicable to cotton manufacture throughout the State, and is largely representative of the general and, withal, rapid tendency of the industry toward the production of refined and expensive goods, in which the cost of skilled labor enters very largely. The increase in the value of goods made is more notable than that in the number of spindles, though the relative proportion of the latter is very considerable. The position occupied by these three cities, as cotton manufacturing centers, may be better realized in the showing that nearly one-half of the value of manufactured goods made in Lowell consists of those made of cotton, while in Fall River and New Bedford the proportion is not far from five-sixths. Over five-eighths of the value of cotton manufactures made in the State is the product of these cities, though the textile industry also shows a disposition to centralize at such places as Fitchburg,—nearly 50 per cent. of whose manufactures consists of textiles, chiefly cotton;—Holyoke, with a percentage of nearly 45; North Adams, with a percentage of nearly 80; Pittsfield with a percentage of nearly 50; and other places of less note, but important. Lawrence, of course, should not be omitted, for about seven-eighths of the value of its manufactures consists of textiles of a very high order, but 70 per cent. of these are worsted, and only about 12 per cent. cotton, the remainder being those of a diversified description.

The tendency toward urban concentration of manufacturing plants is a distinguishing feature in the productive industries of Massachusetts, but perhaps no less so than in other sections of the country which, after all, is simply an example of an economic principle affecting the movements of population among all nations, that of grouping or massing in kindred occupations. In 1895, 76 per cent. of the numbers of manufacturing establishments in the State, and 80 per cent. of the value of their products, were in places having a population of 8,000 or over, while in 1907 the percentages were, respectively, 78 and 84.

The relative amount of wages paid to Massachusetts cotton mill operatives, in 1907 and 1897, possess some significance that deserves allusion to in connection with the advancement that has been made in the employment of skilled labor in exacting duties for the production of finer and more expensive goods, both yarns and fabrics. As is well known to those who have noted the mechanical equipment of new mills, and that of additions to old mills, the spinning of fine yarns characterizes the product, which can only be obtained by a class of experienced and intelligent employes that can demand and secure the best of wages. In 1897, 72.20 per cent. of the wage earners in the cotton mills received less than an average of $8.00 a week, and only 4.98 per cent. received $12.00 and over. In 1907, only 42.34 per cent. was in the low wage group, and 15.45 per cent. in the high wage group. This increase in the wage earning power of mill operatives is due to more than the general advance of about 25 per cent. in wages affecting all classes of labor during this decade, and most of it must be attributed to the greater skill and training required which can be commanded only by better remuneration.

The unthinkable amount of 7¾ billions of dollars of wealth was produced by farmers in 1908 for national sustenance and for export to the craving millions of foreign nations.

American Cotton Manufacturers' Association.

THIRTEENTH ANNUAL CONVENTION. A LARGE ATTENDANCE. NEW ORLEANS COTTON EXCHANGE METHODS GENERALLY APPROVED. THE TARIFF EXCITED SPECIAL ATTENTION. A TARIFF COMMISSION STRONGLY FAVORED. BETTER GINNING AND BALING URGED.

The thirteenth annual convention of the American Cotton Manufacturers' Association was held at the Jefferson Hotel, Richmond, Va., May 25-26, with a large attendance of members and guests, the former numbering about 500 and the latter about 100.

LEWIS W. PARKER.

In many respects it was one of the most momentous conventions ever held by the association, especially with relation to the industry as affected by the customs tariff and the discussion that is being made in congress concerning the schedule rates of duty. A subject of nearly equal importance, and one that excited much consideration, was the relation of cotton spinners to cotton exchanges, with a consensus of opinion more favorable to the exchange at New Orleans than to that at New York.

Members began to assemble at the hotel the night previous to the convention and continued coming up to the time of the meeting. The board of governors had an extended meeting the night before the convention in regard to the details of the program and especially concerning the report of the committee on an uniform sales contract which became a special subject of discussion in the afternoon of the first day. The matter relating to cotton exchanges and uniform sales contract was before the convention that met in Richmond last year, and was the topic of prolonged discussion. The result has been that a special committee to whom this subject was committed has had a whole year to give the question careful study.

The convention opened Tuesday, the 25th, soon after the time at which it was called, with President T. H. Rennie in the chair. Prayer was offered by Rev. Geo. W. McDaniel, after which an address of welcome was extended by the Hon. G. D. Richardson, mayor of Richmond, which was eloquent and especially appropriate to the objects of the meeting. His patriotic allusion to the relations between the industries and people of the North and South were particularly appreciated and applauded. He declared that bitterness, hate and animosity had been banished never to return. The mayor said that he could not present to the members the keys of the city, but Richmond had no walls, no locks, no gates and no keys; all might enter from whatever clime or section and were assured of a sincere welcome. Col. L. D. Tyson, president of the Knoxville Cotton Mills, Knoxville, Tenn., replied to the address of the mayor and alluded to the fact that the association had twice accepted the hospitalities of Richmond, thus showing that if the people wished to have them, the members were glad to come. Mr. Tyson in referring to the conditions of trade said they were not all that could be wished, but the outlook was more hopeful than last year. He believed that when the tariff shall have been adjusted, we shall have good times again.

Immediately after the annual address of President T. H. Rennie which is given elsewhere in connection with this report, H. P. Meikleham, superintendent of the Massachusetts Mills, Lindale, Ga., on the part of the association, presented Mr. Rennie with a handsome watch fob, with the seal of the association, saying it was a gift both to Tom Rennie, our friend, and T. H. Rennie, our president. Mr. Rennie responded briefly telling of his early efforts to bring

ELLISON A. SMYTH.

the spinners together and establish a cordial good fellowship between manufacturers out of which had grown American Cotton Manufacturers' Association.

R. L. McKellar, assistant freight traffic manager, Southern Railway, Louisville, Ky., read a paper on the development of the foreign cotton goods trade which received

close attention. It was followed by a report from D. Y. Cooper, a delegate from the association to the International Convention of Master Cotton Spinners which met last summer in Paris, calling attention especially to complaints in the foreign markets regarding the careless baling of American cotton. At this point a paper was presented to the association entitled "Cotton Waste Manufacturing," by W. A. G. Clark, special agent, Department of Commerce and Labor, Washington, D. C., but the paper was read only by title due to the absence of the author. It was discussed, however, by E. H. Rooney of the Whitin Machine Works, Whitinsville, Mass., who advocated, among other things, a group of mills uniting in the erection of a joint plant for the making up of cotton waste into merchantable articles. Mr. Rooney's remarks were technical and practical and of particular interest to the convention.

The paper read by A. W. Smith, president of the Union-Buffalo Mills Co., on "Baling and Handling Cotton" received close attention, and especially was this the case with the remarks on the subject by Harvie Jordan, Atlanta, Ga., whose opportunities for observing the way American baled cotton reaches its destination in Europe have been unusually good.

Mr. Jordan said: "We are yet using the old primitive, wasteful methods of compressing cotton, yet the spinners stand by and make no demand for a change. It always makes me blush to go to Liverpool and European points and see the bale that is offered to European spinners. I believe the South can save from $30,000,000 to $60,000,000 in freight waste on the excess tare, and wrapping on our present bales, a species of modern graft on the cotton product by the ginners, of putting heavy jute burlap where a compress bale could be used with light covering. Handling as it is to-day, the packing is a tremendous reflection on the ability of Southern men.

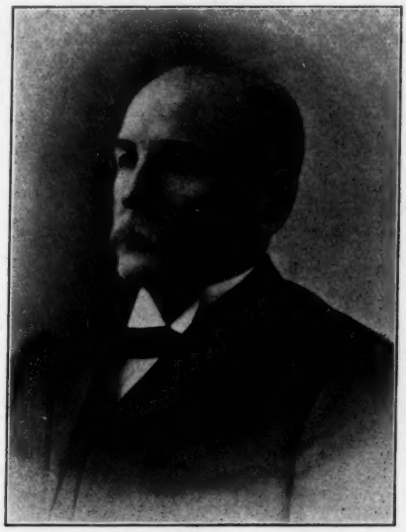
"The way we bale cotton in the South, it takes six box cars to deliver what might go in one car. The bales are mashed out of all shape. It takes 45,000 box cars to move the cotton crop of the South, when it could easily be handled by the use of modern gin compresses in 15,000 cars. One of the principal reasons actuating England, France and Germany in efforts to see whether cotton can be grown in other lands is that it will be properly delivered. The savages of West Africa deliver cotton in better condition in Liverpool than do the Southern markets. We are now letting our raw cotton go to Europe to be made up into fabrics and shipped back to Cuba and South America. No country can get the wealth it is entitled to so long as it sells its raw product."

The afternoon session of the first day was opened with the reading of a paper or more properly an address, by D. A. Tompkins, Charlotte, N. C., on "The Tariff on Cotton Textiles." Mr. Tompkins held his audience closely to his statements and arguments, and the views that he expressed evidently met the indorsement of his hearers. At this point E. A. Smyth, chairman of the committee on cotton exchanges, read his report that had been given a place in the program for the last day's consideration. This report we give, practically in its entirety, in another column. The report of the committee on uniform sales contract by L. W. Parker, chairman, was in a measure, the acceptance of the report of the National Association of Cotton Manufacturers as was made at the recent meeting of that association in Boston last April.

The morning of Wednesday, the 26th, closed the convention. The first paper in order was that by John H. Finney, secretary of the Appalachian National Forest Association, "Forests and Their Relation to the Conservation Movement." This was followed by a business session for active members only. The secretary presented his report which showed the association to be in a flourishing condition, 53 new members having been added to the roll since the last convention.

The committee on resolutions presented its report with the following results:

There were the usual resolutions of thanks to President



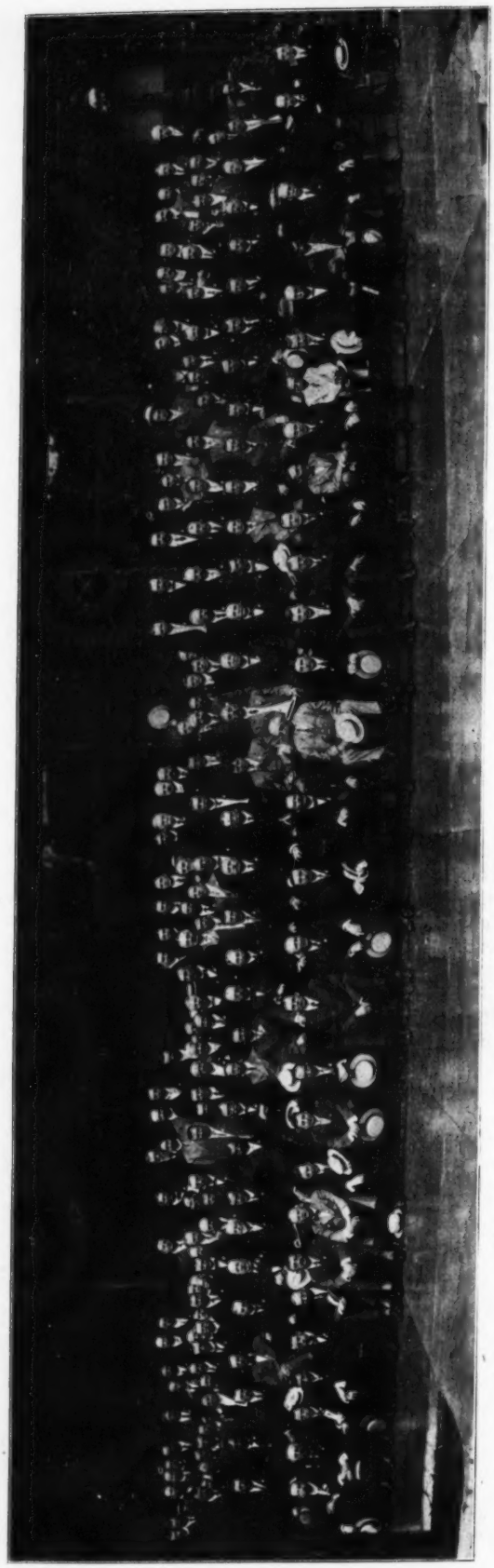
D. Y. COOPER.

Rennie, Secretary Bryant, to the speakers and those who had taken part in the program, and assisted in making this meeting a success. Thanks were also expressed to Miller & Company, of New York, for cotton quotations posted on a board in the convention hall; to the Postal and Western Union Telegraph Companies for courtesies extended; to the Jefferson Hotel, the Chamber of Commerce and citizens of Richmond for hospitable reception, and to the press for reports of the convention, all of which were adopted unanimously.

A resolution which caused more debate was one providing that the association recommend to the various State association of cotton manufacturers and to its membership, that members agree not to sell second-hand bagging unless the buyers agree to tear it up and reweave it. The committee on resolutions reported unfavorably on the resolution, and it was discussed at some length, the argument being that much old bagging is used to the discredit of the cotton shippers and the detriment of the goods in transit.

As a substitute a motion was adopted providing for the appointment of a committee of five to inquire into and report to the next convention better methods of handling cotton and of securing uniform bales, and to take up with the Arkwright Club and the National Association of Cotton Manufacturers methods of handling cotton. President Rennie announced that he would leave the appointment of this committee to the incoming president.

"Resolved, That this association approves most heartily the bill known as the Overman bill, in the United States



DELEGATES AND VISITORS AT THE CONVENTION OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

senate, placing a tax of $12 a head on all immigrants to this country.

"Resolved, That we commend the idea of the 'Atlanta Journal' and the 'New York Herald' in their efforts to create a great national highway between New York and Atlanta, and

"Resolved, further, That we commend the efforts of newspapers and State and county officials looking to the permanent improvement of county and State roads.

"Resolved, That the association appoint a committee of five, who shall report on the subject of better ginning of cotton and baling cotton of a uniform size, and also take up with the National Association and Arkwright Club the subject of establishing uniform rules for buying cotton."

Another resolution indorsed the White Mountain forest reservation plan, the establishment of State forest areas, and urged immediate action by State and national legislative bodies to bring about conservation of the nation's resources, and especially of the forests.

After a brief debate, the following recommended by the committee on resolutions, was adopted:

"Resolved, Whereas some 20,000,000 to 30,000,000 pounds of cotton waste is annually imported into this country to compete with the waste of American mills, thereby depressing the price of waste of American mills; therefore, be it

"Resolved, That this association respectfully requests the Congress of the United States to place a reasonable duty on cotton waste to act as a protection to American mills in abnormal times.

"Resolved, That this association express its thanks to D. A. Tompkins for his very able address upon the subject of 'The Tariff on Cotton Textiles,' and expresses its entire approval of the suggestion made by him for the appointment of a tariff commission.

"2. Resolved further, That this association, recognizing that a tariff is essential for the raising of revenue for the government, feels that such tariff should be so made as to afford incidental protection to those industries at a disadvantage in manufacturing as contrasted with foreign manufacturers; and that, therefore, as the manufacture of cotton goods of the United States is done under such disadvantageous circumstances in the matter of cost of production, we earnestly urge our representatives in Congress to place such duties on cotton goods as will serve to encourage the production of all classes of these within the limits of our country.

"3. Resolved also, in order to secure the necessary information as to what duties can be equitably levied upon imports, That this association urge our representatives in Congress to make provision for the appointment of a tariff commission."

The president then appointed two additional members to the committee on uniform sales contracts which is continued for another year for a special study of the problem with relation to yarn manufacturers. The new members of the committee are J. P. Eddy, Jr., Providence, R. I., and R. M. Miller, Jr., Charlotte, N. C. By special request S. B. Handy, Philadelphia, was added to the committee.

A resolution was adopted creating a new office in the association—secretary of statistics—whose duty it shall be to compile annually statistics of the cotton mill industry. The new office is to be filled by the Board of Governors.

The committee on nominations reported the following list of officers, who were elected unanimously:

President—L. W. Parker, of Greenville, S. C.

Vice-President—Charles K. Oliver, of Baltimore.

Secretary—Charles B. Bryant, of Charlotte, N. C.

Chairman of the Board of Governors—Elbison A. Smyth, of Greenville, S. C.

New members of the Board of Governors to succeed those whose terms Expire—W. A. Erwin, W. H. Harris, C. D. Tuller, C. H. Moody, Ridley Watts and L. D. Tyson.

The members of the board who continue in office are: D. Y. Cooper, Henderson, N. C.; John C. Rankin, Lowell, N. C.; Charles K. Oliver, Baltimore, Md.; E. A. Smyth, Greenville, S. C.; Aug. W. Smith, Spartanburg, S. C.; F. A. Flather, Boston, Mass.; Leonard Paulson, New York; E. Chappell, Atlanta, Ga., and Charles B. Amory, Boston, Mass.

Annual Address of President T. H. Rennie.

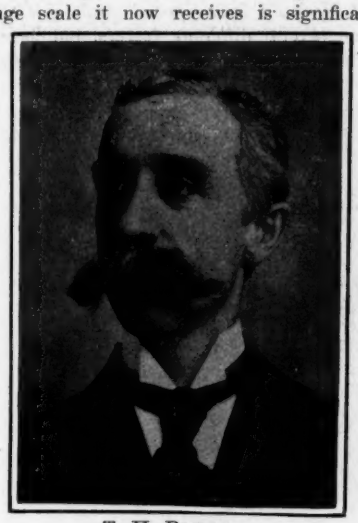
A survey of the year just passed reveals the existence of peculiar and unusual conditions. If the present tendencies of business were such that the influence of this period could be said to have ended, that a turning point had been reached and that from this day onward developments could, with some degree of accuracy, be described as positive or negative in their character, the task of submitting my annual report would be a much easier one than I take it to be. My ideas of the situation are fortified by the fact that the money market offers funds in large amounts at attractive rates and that despite such favorable inducements to the borrower no ready outlet can be found among merchants and manufacturers. Until American enterprise and ingenuity can find profitable employment for our available cash, we may consider that we are still marking time with faces turned midway between the panic of the past and the prosperity of the future.

No small part of our present uncertainty can be ascribed to pending tariff revision. Our national economic history shows that tariff adjustments, whether upward or downward, have the same temporary influence upon trade conditions. It is characteristic of the race that, while ready to bravely face and overcome known dangers and handicaps, some timidity is shown where the opposing forces are uncertain in their magnitude and direction. With the tariff question settled I look for marked improvement in all lines of trade and commerce. Very happily for us, the schedules bearing upon the textile industry do not present the wide divergence of expert and political opinion that has been shown elsewhere. This is due to the fact that the cotton industry in this country bears a very remarkable relation to the tariff so that it combines every republican principle of protection with every democratic theory of revenue. I think it can be taken for granted that the Cotton Schedule of the Payne-Aldrich bill meets with the general approval of our organization.

Organization is the spirit of the age and our existence has been amply justified by results accomplished. For several years the question of reforming the future contract has been a live one among our members. It can not be doubted that the recent action of the New Orleans Cotton Exchange was in a large measure due to our agitation. It is equally true that the new rules so wisely promulgated will be of vast benefit to the producer, the manufacturer and the consumer of cotton.

The problem of adequate labor is not serious at this time. With the growth of industrial enterprises in the South such as is certain to follow in the future, ways and means must be devised to divert to this section the tide of immigration which is now seeking homes where the opportunities for success and happiness are not so wide as here.

In passing, mention should be made of the report of the Committee of the International Federation of Master Cotton Spinners which recently visited America. Their statement that European mills need not fear American competition so long as our labor was paid the higher relative wage scale it now receives is significant. This



T. H. RENNIE.

handicap we must strive to overcome by some method other than wage reduction. We must aim to raise the level of American efficiency in our mills so that our higher wage is warranted by a corresponding increase in individual output. This can only be accomplished by widening our educational facilities along technical lines so that the American workman is better equipped to gain and maintain our manufacturing supremacy.

Without going into detailed statistics, the cotton crop of 1908 measured up to what had been anticipated, affording a sufficient quantity of unusually fine staple to meet all present demands. From progress thus far made it is not unreasonable to hope that the new crop will approximate its immediate predecessor. The level of prices now enjoyed by the producer must sooner or later react upon finished goods bringing advances which yield a more agreeable profit to the manufacturer.

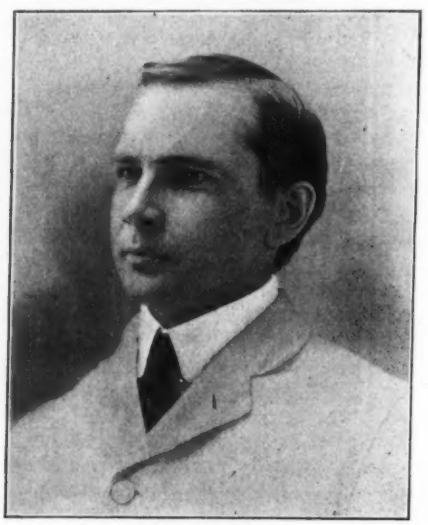
Cotton Waste Manufacture.

BY W. A. G. CLARK.

The question of waste is one of the most important that confronts the cotton manufacturer and the percentage of waste made frequently determines inversely the percentage of profit.

In the manufacture of cotton goods some waste is unavoidable and what is the most profitable plan for disposing of such waste, whether to rework with good cotton, to rework by itself or to sell outright, is one to which American manufacturers are paying close atten-

tion. Part of the waste made in a mill is "invisible waste" that is a dead loss, but there is more or less money in every pound of "usuable waste." The larger percentage of the American mills seem to sell the bulk of their usuable waste to be either manufactured elsewhere in the country or abroad. A large number of mills rework a good portion of their waste by mixing with new cotton, but in such cases, even when running into low grade 6s. or 8s. about 50 per cent. of waste is as heavy a mixing as is usually practicable. In a regular waste plant practically the entire waste output of a mill from the motes to the hard waste can be worked with little or no new material. Whether it will pay better to rework the waste made with a large percentage of new cotton or to run it straight by itself in a special plant is a question that depends on several different factors, but as a rule there will be found to be more money in a special plant especially in times of depression when the lowest grades of waste that can not be reworked in the regular cotton mill are bringing prices that hardly justify the expense of hauling away for fertilizer.



W. A. G. CLARK.

The manufacture of waste is a separate industry in itself and except for very large mills it will not pay the management to install a special plant for this purpose, but if six or seven large mills in a locality combine in building and operating a waste mill it should prove the best solution. Intelligently managed waste spinning is an operation that well repays the trouble entailed.

Cotton waste manufacturing plants are modeled on the system used in woolen plants. In the system of drafting that is used in regular cotton manufacturing it is necessary that the fibers be of approximately the same length, otherwise the long fibers are broken while the short ones drop through. This difficulty is met with in the case of short fibered waste mixed with new cotton, entailing much waste in the process, and every time this is run through again its cost is increased. The woolen system of manufacture is specially designed to deal with fibers of widely varying length, and as this is the case with the various classes of waste made in a cotton mill, any plant to work up the total waste output of a mill necessarily has to be modeled on this principle. The woolen system not only gets the waste into yarn with less new waste, but also gives a more even and a more oozy yarn so that the yarns thus made have a wider range of usefulness.

There are two main systems of manufacturing of cotton waste, the condenser or vigogne, and the coiler or barchent.

In the condenser system there are used the following machines: (1) opener, (2) picker, (3) double automatic waste card, and (4) waste mules.

In the coiler system there are used: (1) opener, (2) picker with lap forming apparatus, (3) breaker card with 1, 2, 3 or 4 cans, (4) derby doubler, (5) roving card, and (6) waste mule.

Each system is subject to variations and instead of the mule there may be substituted either a ring frame or a tubular cop machine to make yarn for specific purposes.

There are, broadly speaking, two kinds of waste—soft waste which contains no twist, and hard waste in which some twist has been inserted. In opening the hard waste and reducing to its original fibrous state a six cylinder machine is the best, the spikes on the successive cylinders being graduated. For soft waste the opener has only one beater but various types of machines are used. The one usually preferred is the Crighton vertical opener as this gives a very thorough cleaning action. The waste is fed by hand or lattice into a spout leading to the bottom of the cone-shaped box in which is set a vertical shaft carrying horizontal blades. The waste is drawn up from the bottom and out at the top by means of a suction draft and in its passage upwards it is struck by each blade in turn.

From the opener the waste goes to the picker where it is fanned and beaten by a porcupine beater and then dropped into a bin for use in the automatic waste card or else rolled up into a lap for use on a breaker card according to the system. In some cases the opener and picker are combined in one machine but more often they are separate. For some purposes it is better that the waste should be of a greasy character and to impart this to the cotton there is occasionally used a "soaper" which is an appliance fitted to the opener.

In running a waste mill the mixing is one of the most important points to be looked after and a knowledge of how to get the cheapest mixing to make satisfactory yarn of the grade required without excessive waste is one of the most important requirements of a manager. Usually the waste is mixed before opening but sometimes afterwards.

Waste is always double carded and sometimes triple carded, the latter being especially used for numbers around 8s. or higher. The woolen roller and clearer card is essential for this work and the cotton card with its revolving top flats is not applicable.

For the condenser system there are used automatic waste cards, consisting of either two or three roller and clearer cards coupled together so that the process is continuous. As the slivers from the finisher card go to the mule direct it is essential that they should be uniform in weight and to secure this object some form of automatic feed has to be applied to the hopper from which the waste is fed to the first card. The Bramwell automatic feed is usually employed and the type in which the weighing feed pan is discharged by overturning is preferred to the one that opens out. Of automatic intermediate feeds between the cards there are several well known types.

The two main types seem to be the camel back fed in which the web is condensed into a ribbon about a foot wide and then carried between two moving lattices up and over to the feed plate of the finisher card, and the Apperley in which the web is condensed into a genuine sliver or round rope of fibers without twist and then this carried over and laid diagonally on the feed plate of the finisher card. The Apperley gives very thorough blending, but the camel back puts less strain on the material. It is sought to deliver the fibers finally in a crossed and intermingled condition—as distinct from the parallel arrangement—and to aid this not only are roller and clearer cards used but the intermediate feeds are always arranged to lay the material on the feed plates either crosswise or diagonally.

The cotton is taken from the finisher card by a condenser which divides the doffer web into a number of narrow strips which are rubbed into slivers and wound side by side on long condenser spools. The number of these divisions or slivers vary according to the card width and the counts to be spun. On a 65-inch card making sliver for No. 4s. there will be used four condenser bobbins carrying 40 slivers each or 160 slivers total. These condenser bobbins go direct to the mule as they are or, if a ring frame is used, each separate sliver, wound in the shape of a cheese, can be slid off the spool and mounted in the frame creel separately.

In the coiler system the carding process is not continuous, but there are used two roller and clearer cards and between these two is interposed a Derby doubler. Picker laps are put to the breaker card and at the front the web is divided and slivers run into two cans simultaneously. Two is the ordinary number of cans used though there may be any number of cans from 1 to 4. These cans are put up to the triangular steel table of a Derby doubler and 40 slivers after running together under heavy rolls are wound up into narrow compact laps half the width of the finisher card. Four of these narrow laps on two laps sticks are then put on the feed plate of the finisher card and go through to be condensed and wound onto condenser bobbins as previously described.

From either system the condenser bobbins from the card then go to the mule. The waste mule is similar to the woolen mule, and different from the cotton and the worsted mule in that there is no roller draft, also in that the spindles are square ended instead of pointed. The condenser spools with their series of adjacent slivers are laid horizontally on the back of the mule and each sliver run under a single self weighted roller and thence to the spindle. The speed of the spindles vary according to the strength and quality of the material supplied.

The mule is ordinarily used for spinning waste as it is especially adapted for such work with short fibers and waste can not be run straight on ring frame without excessive twist. Recently an ingenious German, F. Grun, of Gebweiler, has invented a machine that combines most of the advantages of the two methods without their drawbacks, making an even, lofty yarn and yet preserving the special advantages of the ring frame in regard to economy of space, of first cost and of operating cost. This machine can not take the place of the mule except for certain specific yarns, but for the purpose for which it is used it seems to be a decided success. In this system for the regular roller draft between two rolls set slightly more than the length of the fiber apart there is substituted rolls set a longer distance apart and the roving in its passage from one roll to the other is held up and supported by a needle roll after the manner of the French porcupine roving box system as used in French worsted mills. Then between the front roll and the spindle there is interposed a second draft arrangement consisting of a revolving through roller working in a bottom roller. The through going roller is provided with cam-like projections which twice in every revolution lift it clear of the bottom roller. When this roller is up the twist is transferred to the thin places in the roving between the spindle and the front roller and then when it drops into place and a draft is developed between the front roller and the second pair of rollers the thick, soft places are drawn out. This intermittent action is similar to the carriage draft on an ordinary mule and tends to make a more even and also a more lofty yarn than can be obtained on the ordinary frame. As the two drafts are multiplied together the resulting draft is larger than otherwise obtainable and this has the advantage of permitting heavier roving to be used to withstand the necessary drag of the ring system. The machine is usually creeled with cheeses or sections of single ends taken from condenser bobbins. This German waste spinning frame has not been introduced long but is successful in Germany and is now being introduced into England.

The tubular cop machine is also sometimes substituted for the mule especially for making filling for carpets, etc., in cases where it is permissible to insert sufficient twist.

Besides these two main systems of waste manufacture there are other methods employed for certain purposes such as making batting and felts, where there is used only a two cylinder Garnett machine and a square box willow.

In the economical use of byproducts and in waste manufacture the Germans are ahead of either England, the United States or France, but with the progress that the United States is making along this line it is hardly probable that this can continue long. The English mills in manufacturing cotton waste seem to use the coiler system most largely while the bulk of the German mills seem to prefer the condenser.

In 1907 the German waste mills besides using their home production imported 60,391,225 pounds of linters and 72,379,360 pounds of general cotton mill waste. They ran part of this waste straight and part they mixed or interwove with cotton, wool, jute, silk or other textile fibers making cheap hosiery and underwear, blankets, carpets, backing for clothes and fleece lined underwear, candle wicks, cretonnes, cheap twilled sheets, sanitary napkins, scrubbing cloths, tapes, cords, coarse towels and many other articles. Of the waste exported by the United States, Germany takes the larger portion and part of this waste after manufacture goes to the Philippines in the shape of cheap blankets and underwear and part is even shipped back to the United States in coarse manufacture as cheap scrubbing cloth, towels and rags.

In 1905, the production census of the United States showed that American cotton mills that year sold 247,335,192 pounds of waste and received for same $10,042,037. The present amount that is sold by the mills must be somewhere about twelve million dollars and of this at least a fifth is sold for export. Our export of cotton waste for the last three calendar years has been as follows:

	Pounds.	Value.
1906	40,570,960	$2,099,869
1907	48,502,474	2,579,582
1908	43,706,832	2,547,871

Baling and Handling Cotton.

BY AUG. W. SMITH, SPARTANBURG, S. C.

For years I don't think the farmer ever thought of improving his seed, but in later years, there has been a good many experiments, and the more wide-awake farmers are beginning to test their seed before planting, or that is to plant a few rows of special seed and save out the best stalks and boles on the stalks for another year's planting, and gradually building up the staple and body of the lint.

Of course cotton for ordinary use, in numbers running from thirteen to forty, an inch staple is sufficient, and after that the staples are paid more attention to.

MORE UNIFORM STAPLE NEEDED.

We ought to encourage this and try to get them, by talking and discussing this point every chance we get with the farmer, to use seed that will produce more uniform staple. For several years they have been planting in many sections, more or less, a cotton called "Florodora." That on uplands produces a longer staple than the ordinary cottons, but the great trouble is there are no gins to gin this cotton, and it is carried to the ordinary gin and ginned right after or before a bale of ordinary cotton, and some of the seed get mixed with the ordinary seed, and the next year, the seeds are planted, and the staple is mixed all through the man's crop, and then when we undertake to put it into yarn, we have the trouble of cockle-yarn, which we all know is a great draw-back to making even, nice running cloth.

GATHERING COTTON.

The gathering of the crop is another point that ought to receive attention. The only feasible way that has ever been found is gathering by hand. There have been several inventions to gather the cotton by machinery, but none have as yet proved successful. The great trouble with the cotton pickers is that they can not separate the lint from the trash in gathering. There is now a machine on the market which gathers by suction, on the same principle as the house-cleaning machine. I don't think, though, that this machine has reached perfection, and it is very expensive, and could not be used except by very large planters.

One man can cultivate a great deal more cotton than he can gather. It takes about four hands to gather as much as one can cultivate, and of course in the gathering season when hands are scarce, the cotton is left in the fields for such a time that it becomes blued and deteriorates and makes the fiber brittle.

In all meetings of this kind and all papers that are written on this subject, we ought to pay particular emphasis to trying to get the farmer to gather his crop as quickly as it opens.

GINNING AND BALING.

The ginning and baling of cotton is the most important point that we must consider. This subject was considered at length at the second international conference of cotton growers, spinners and manufacturers held at Atlanta, Georgia, October 7th, 8th and 9th, 1907. They passed several resolutions and discussed the different kinds of bales, and after two days' discussion, I don't think they had gained a point. It is impossible for us to say to the farmer, "you have to put your cotton up in a certain kind of bale or we will not buy it," or to say to the transportation company, "you have to haul certain kinds of bales or we will not receive it." There are too many interests, and too many men that get a little rake-off, to change the mode of baling and handling cotton too rapidly.

All that we can do is to recommend and discuss and try by a plan of education to improve these methods.

At that meeting in Atlanta, the resolution was passed, "Every gin shall be put in the best order possible. All cotton should be, where possible, housed not less than thirty days before ginning. Cotton so housed will bring a premium." It is a well known fact that if you pack seed cotton in a house and let it stand for thirty to sixty days, the staple improves and keeps on growing by exhausting the oil from the seed, but the point is,—how are you going to get the farmers to do this? It would require immense buildings on every plantation and the expense would be entirely too great; so, all that we can do is in discussing the matter with the farmers, to tell them of this point.

Another resolution, "We recommend that all planters, wherever practicable, put in as rapidly as possible, gin compresses." Now if this could be done, this would cut the railroads out of the profit on compressing cotton, but I think it will be a long time before any number of these compresses will be put in. A press of this kind would cost in the neighborhood of five thousand dollars ($5,000.00), and how many planters in Alabama, Georgia, South Carolina and North Carolina could afford to pay five thousand dollars ($5,000.00) for a cotton press?

THE TYPICAL BALE.

At that meeting a great deal was said about the different bales of cotton, and several photographs were produced, showing how cotton was put up in Egypt, in Mexico, in East India and in America. The American bale was the poorest packed bale the worst looking bale of all others except the Mexican bale. The Egyptian bale was decidedly the nicest looking bale, and showed less waste than any of the others. I would suggest that we try, by resolution, to emphasize the importance of the farmer using a press, putting up their cotton as near the shape, density, thickness, weight and covering of the Egyptian bale as possible. They use a lighter material or burlap for covering, and they use a great many more ties, which prevents the cotton, when cut between the ties for sampling, from falling out, and prevents dirt getting in the cotton as it does in our loosely packed American bale. You can see by this picture the packing of the different bales. They also go on in their resolution and say, "In baling of cotton the Egyptian character of bale to be adopted, the ties to be of the Egyptian type, and ten in number; the length of the bale to be 48 inches, the width 21 inches, the weight 500 pounds, the density 35 pounds, the bale to be marked upon both ends with weight, grade and staple." This would all be very nice and would be a great help to us, but the point is,—how are we to accomplish it? We can write, we can pass resolutions, we can have meetings with the farmers, but it is going to be a number of years before we accomplish anything definite. All that we can do is to keep on from year to year, and gradually improve the present methods.

BAGGING MATERIAL.

In one resolution they say, "We condemn the bagging now in use; first, because of its rough and coarse nature it invites rough treatment; second, it does not hold the marks; third, on account of its great weight and bulk it entails heavy loss in freight. We therefore recommend the use of a light burlap or covering made of cotton such as Osnaburg, 10 ounce weight per yard, 40 inches wide." Now that is a very sensible resolution if it could be carried out. The Osnaburgs were tried several years ago when the price

of jute bagging went up so high, and the farmers undertook to break the trust, but my recollection of it at that time, was that it didn't answer the purpose. My idea is that a light burlap,—a 12 ounce or 14 ounce as we use on baling export goods, would be the best covering, and then use ten to twelve ties of a great deal lighter weight than the present ties; so making the tare on both about eighteen pounds, which is, I believe, the tare on the Egyptian bale.

I think one of the most important points in this connection is the matter of the manufacturers' selling their second hand bagging and ties. We think we are making money by selling this waste, but in fact, we are paying more the next year for this bagging and ties than what we get for them, especially the plan of fixing up the bagging and ties into patterns and selling them that way. I think it would be a good thing if we could get the manufacturers to all agree that they would not sell any bagging and ties in patterns, but would only sell to concerns by the pound that would tear up the old jute and re-weave it into new bagging. After this bagging has been once used, it has to be patched, and this is left to very careless help, and they use a great deal more bagging than is necessary, and therefore we are paying ten cents a pound or more for all this bagging. I really believe this is the most important point in the whole matter of "handling and baling cotton," and this is a point that could be carried out, for the manufacturers can agree to say, "We recommend as a national association to the different State associations that they get every member to agree that they will not sell except to those who will tear this bagging up and re-weave it."

If you have ever noticed on the floor of your ware-houses where it has been emptied of cotton, the amount of cotton that has been left on the floor and has to be swept up, you will see the immense waste that this old second hand bagging is producing. There has been such complaint by consumers of American cotton of the careless methods of baling and wrapping,—unnecessary waste, deterioration in quality, and great danger from fire, that the Government through the Department of Commerce has issued a bulletin with reference to this subject, and in this bulletin they recommend very strongly the baling and wrapping of our cotton like the Egyptian and Indian packages.

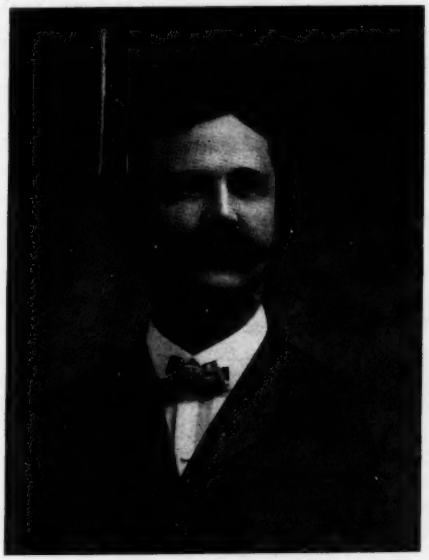
COMPRESSION AT THE GIN.

Of course it would be a great thing if we could get the ginners to put in the gin compresses, but what are you going to do with the present mode of compressing cotton by the railroads? If we could gradually get these gin compresses put in, I believe that the rate on cotton would be materially lowered, if we could cut out the expense of compressing and still enable the railroad to haul as many bales by this new process of compressing, as the present compressed bales, but this of course is going to take time, and all that we can do is to continue to recommend and in a few years we will see quite an improvement in this line.

One of the most important points in the handling of cotton is the mode and manner of buying and selling. The cotton manufacturers of South Carolina have been for years trying to perfect rules for buying cotton, and we have from year to year improved these rules, and now we have a form of rules known as "The Carolina Mill Rules" or rules adopted by the Cotton Manufacturers' Association of South Carolina and the Cotton Manufacturers' Association of North Carolina. I think it would be of great benefit if we, as a national association, could adopt uniform rules for the purchase of cotton. I have brought several of these rules with me, and would be glad to give to any member who would like to read them over. They are too long to include in this paper, but there are one or two points that I will mention,— the matter of buying certain grades and what per cent. that we allow the seller to ship of grades below and above this grade, and another important point is the matter of tare.

TARE AND FRANCHISE.

Our rule states that on compressed cotton the tare shall not exceed 24 pounds, and on uncompressed cotton 20



AUG. W. SMITH.

pounds per bale, and any excess constitutes a just claim against the seller. Now a great many of us think that 24 pounds is too great, and we ought to allow only 20 pounds on compressed cotton. Another important point is that for years the seller was allowed 3 pounds franchise on all cotton shipped. This was so abused by shippers billing up their cotton and always making the three pounds, that in our last rules, we have cut this practice entirely out on both the compressed and uncompressed cotton. At first a great many of the sellers said it could not be carried out, but I don't think there has been any trouble in doing this as all the members of the manufacturers' associations of North and South Carolina agreed not to buy except on these rules.

I was talking to a compress man the other day, and I asked him how much bagging he put on cotton when being compressed; he said it was dependent entirely upon what the seller required him to do; that he would put on any amount that they wished. Some would ask for three and as high as seven pounds extra bagging to be put on. He said this was not required for covering the cotton, but it was in order to make the full amount of tare and a great deal above the regular amount of tare. We have found as high as ten to twelve pounds more bagging on shipments of cotton than are allowed by our rules, and we have always made the claim and have never been refused payment on this excess tare except once.

RULES FOR BUYING COTTON.

I would suggest that a committee be appointed to get up rules for buying cotton to be used by all of the members of

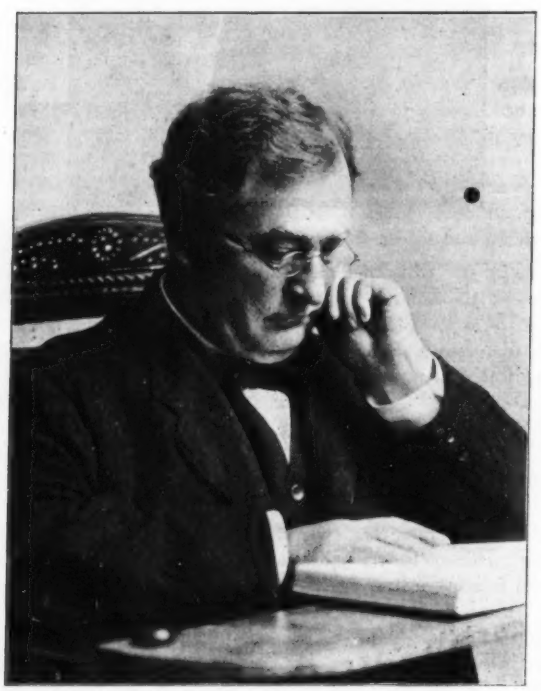
our association. All that I think we wish is fair treatment, and I know there will be some opposition to this, on account of some of our members being cotton merchants and cotton sellers, but I believe it would prevent a great deal of misunderstandings and in the long run, would prove of great benefit.

Cotton Goods Tariff.

BY D. A. TOMPKINS.

The present duties on coarse cotton goods, such as are made in the South, are necessary for the maintenance of the factory system. The factory system is necessary to the welfare of the Southern cotton farmer and incidentally of all the people in the cotton growing states.

It has already taken enough people out of the business of raising cotton to make the price of cotton double what it used to be. It has given good values to perishable farm products, such as vegetables, fruits, chickens, eggs, milk, butter, etc., by the markets the factory population makes for them. It helps by taxes to provide good roads which in turn enhances the value of land and of markets. Now that we have the factories everybody is better off than they used to be when everybody was raising cotton at five cents a pound.



D. A. TOMPKINS.

THE ADVANTAGES OF ENGLAND.

The reason why the present duties are necessary is that England has over us the following advantages in cotton manufacture:

(1) She has an army of textile workers having an inheritance of special knowledge and skill.

(2) An abundance of labor which does not shift.

(3) A merchant marine whose ships take the goods from the mill door via the Manchester ship canal to all parts of the world.

(4) Abundant capital and cheap interest rates.

(5) A Royal Exchange in Manchester—the center of the English mill district where the buyers of the world meet the mill men and trade direct.

(6) A banking system which extends into the market centers the world over which gives safety to credits and safe exchange.

(7) We have no advantage in the price of cotton. It moves in subsidized English ships from Galveston and other American ports and is delivered at the mill in Manchester, England, as cheap as at Fall River or Charlotte.

England's advantages may be estimated as follows:

(1)	Inherited knowledge and skill	2½%
(2)	Abundant cheap labor	2½%
(3)	Merchant Marine (subsidies)	5 %
(4)	Abundant cheap capital and cheap interest rates	2½%
(5)	Royal Exchange	5 %
(6)	Banking system in foreign com'l centers	2½%
(7)	Raw cotton	0
(8)	Difference in labor costs	10 %
		30%

According to these estimates England has a distinct advantage of 30 per cent. over us and this percentage becomes much greater in the coarser numbers. It is very important that the Southern farmer and manufacturer co-operate to hold the tariff on coarse cotton goods at the present figures.

BENEFITS OF FACTORY DEVELOPMENT.

Before the development of the factory system in the South everybody made cotton and with the competition of everybody in the field cotton went to five cents a pound and well nigh ruined the Southern Cotton farmer. The development of factories has called for factory operatives and this has taken many cotton farmers out of the competition. It is not alone that the cotton competition has been reduced, but the factories of the South are now consuming more than 2,000,000 bales of cotton. This is not all: besides taking a great number of people off the farms, and besides consuming 2,000,000 bales of cotton in the factories, a demand has been made for at least $100,000,000 perishable farm products per year. This means that the farmers get $100,000,000 for their vegetables, fruits, milk, butter, chickens, eggs and all such stuff for which farmers formerly had no market at all. If we go back to a period approximately 15 years ago, before the factory system was developed we find that cotton was five and six cents a pound and that the entire cotton crop was worth $300,000,000 when the Southern people did nothing but make cotton and sell it in our State. Now by the development of the factory system and by the development of diversified crops, including dairying, fruits and vegetables, the South has a gross income at least four times $300,000,000. In the first place the cotton crop is now bringing ten and twelve cents instead of five and six cents. This makes for 10,000,000 bales $600,000,000 instead of $300,000,000 as formerly. Besides this doubling of values in the raw cotton itself the South has now other incomes approximately as follows, and annually.:

The cotton oil industry yields more than	$100,000,000
Perishable farm products consumed locally, which formerly had no market	50,000,000
Perishable farm products shipped to Northern markets, formerly not shipped	50,000,000

Extra value of 2,000,000 bales of cotton manufactured instead of sold in the raw state 150,000,000

and many other advantages by the diversification of pursuits.

The total manufactured products consumed by the United States would not exceed those made from 4,000,000 bales of cotton. If we put a tariff on these products that would raise the price two cents a pound the total increased price for all the people of the United States would not exceed $40,000,000. We have seen above that protection would be justified for enhancing the value of the raw crop itself $300,000,000 and Europe has to pay at least 6-10 of this enhancement. We have also seen that we give active values to perishable farm products also increased values to the manufactured products of cotton itself of more than $200,000,000. We pay $40,000,000 bonus to make a profit of nearly $1,000,000,000 on what formerly yielded only $300,000,000 would seem to be a good enough commercial transaction.

I have pointed out the disadvantages under which American cotton manufacturers labor as compared with England. With these disadvantages equalized we have seen what immense additional values we can get out of our lands and our factories. I hope to see the unequaled conditions removed when we get ships upon the deep seas, banks to handle our commercial business in the markets of the world and some selling arrangement equal to the Royal Exchange of Manchester and other points as explained above, then we may accomplish all this without a tariff, but until then we have need to maintain the tariff.

REVENUE FROM IMPORTED COTTON GOODS.

The duties now being paid on imported cotton goods aggregate about $50,000,000. This is a fair amount of revenue for the cotton goods trade to pay towards the support of the government. Neither wheat nor corn pay approximately as much. In other words, cotton goods are paying a good part of the government expenses while corn and wheat are not paying their proportionate part. There are many who write fanatically on this subject who berate against all tariffs. These totally ignore the fact that the tariff is but one of the taxes by which the government gets revenue for expenses. In the present situation any discussion of other methods for raising revenue is wholly academic. Our federal revenue system is largely a tariff system and we are compelled to make laws in recognition of that fact.

DEVELOPMENT OF FOREIGN COTTON GOODS TRADE.

BY R. L. McKELLAR.

In the few years that our manufacturers have been seeking foreign trade, they have not undertaken to acquire the intimate knowledge of the peculiarities and requirements of the trade itself, which is necessary to enable them to successfully compete with the manufacturers of other countries enjoying advantages either in proximity or long established trade relations.

Any increase in India's cotton production will be consumed by its own mills; and Egypt's increase, even if substantial in percentage, can at best amount to comparatively little in actual number of bales; whereas, the United States, with proper reclamation of abandoned and impoverished land, and the opening up of new lands, the use of improved farming processes, and the extended and scientific use of fertilizer, can, if necessary, increase its crop to 40,000,000 bales, or, probably to the requirements of the world, without encroaching upon the area necessary for diversified agriculture.

FOREIGN TRADE SHOULD BE STUDIED.

What is necessary to bring about a more intimate knowledge of the peculiarities and requirements of the Oriental trade? In my opinion, highly intelligent, reliable and experienced men should be sent abroad to study these conditions, and that these men should not be sent in ones and twos, but in goodly numbers. If these practical men can not be sent by our Government, they should be sent by the manufacturers.

In contra-distinction to our limited representation, let us compare the policy of Japan since the Chinese-Japanese war, which is, to send abroad students and others who have shown exceptional ability or aptitude, for the purpose of studying industrial and commercial conditions, methods, ways and means, and also to search out markets for Japanese goods. The number thus sent has increased from 12 to 1896 to something like 100 at the present time. These special agents do not include private students in colleges of foreign countries, special agents of private companies, or manufacturers going abroad to investigate and purchase machinery for private plants. The countries to which these investigators are sent, are, the United States, England, Germany, France, China, South America, Australia, in fact anywhere for special subjects to be investigated, processes learned and conditions observed, and information gained, likely to be of value to the industrial or commercial development of Japan. It is highly probable that any number of Japanese are now studying cotton manufacturing in the United States. The custom of making a study of foreign trade is by no means new. It was the custom in ancient times for merchants to send their sons under convoy of caravans to distant countries, as a necessary part of their education, and to obtain instructions from teachers in arts and sciences, and also in the ways of commerce. Letters, circulars and catalogues will not answer. It must be done by persevering, intelligent, personal effort. After a line of goods or a single article has once been successfully introduced, catalogues, circulars and newspaper advertisements may be used to advantage.

CHINA IS AN ATTRACTIVE MARKET.

China with its 450,000,000 inhabitants, its unlimited and undeveloped mineral resources, its immense rivers and fertile valleys, its primitive knowledge of manufacturing, and its warm climate, calling for light clothing, is unquestionably the most attractive single market for the product of our cotton mills. Manufacturing in China is limited largely to what is done by hand; machinery is conspicuous by its absence, and except in a few industries, the great moving power is manual labor. In agriculture also, the farmers slavishly follow a routine that has been handed down unchanged from untold generations, and not only display no inventive powers themselves, but obstinately refuse to profit by inventions of other countries. The great hope and expectation for a change in these conditions is in railroad building, which is, as yet, quite limited, the total mileage of the Empire aggregating only 3,091 miles.

With the completion of the Panama Canal, the trade of the Orient will be almost at the doors of the Gulf ports and suitable steamer service will no doubt be inaugurated direct

from Gulf ports to the Oriental ports by the time this great ocean thoroughfare is thrown open. This will also place the United States in almost direct communication with the ports along the Western coast of South America, which, at the present, are practically unknown to us.

SUGGESTIONS.

The following suggestions are submitted for your consideration:

First: Employ in the development of foreign trade the enterprise, energy and aggressiveness characteristic of Americans.

Second: Ascertain by means of resident agents, what are the wants and needs of foreign countries, then manufacture and send them what they want, and pack it to suit them.

Third: Appoint these agents in all countries where a market for cotton goods exists, or can be made to exist.

Fourth: Send your ablest and most experienced manufacturers to these countries to make these appointments.

Fifth: Urge the government to increase the number of its special agents assignable to cotton goods trade.

Sixth: Adjust your credit system to meet the requirements of the trade you are wanting, and the competition to be met.

Seventh: Utilize to the fullest extent the experience and assistance of American banking institutions in foreign countries.

Eighth: Organize an exporters' association, for the special purpose of giving its members by exchange or otherwise, the full benefit of any and all information obtainable respecting foreign trade and the most effective methods of developing it.

Ninth: Make the consuls of foreign countries honorary members of your organization, and in this way invite their support and co-operation.

Tenth: Urge our statesmen and law-makers to rehabilitate our merchant marine by taking prompt steps to place it on an equal footing with that of competing nations.

Report of Committee on Cotton Exchanges.

Under the instructions from the American Cotton Manufacturers' Association at its meeting in May, 1908, your committee on cotton exchanges approached the New York and New Orleans cotton exchanges, seeking interviews with committees from those exchanges, and an opportunity to present the views of cotton manufacturers as to the changes desired in the contracts of both exchanges. Your committee held two conferences in the city of New York with the committee from the New York Cotton Exchange, and were most courteously received, and our suggestions listened to and thoroughly discussed.

Among other matters considered was the question of the advisability of having two forms of contract, if it was deemed not practicable to so reform the present contract of the New York Cotton Exchange as to meet the views of our association as expressed in the report of this committee, submitted in May 1908, and adopted by the association. This second contract was to be called the "spinner's contract." The adoption of two different contracts had not been previously discussed or considered at the meeting of our committee; consequently, it appeared that the committee of the New York Cotton Exchange was disposed to give favorable consideration to the question of this spinner's contract, and our committee, being approached by the New York Exchange committee to know if we would recommend the dual contract, decided that they could not advise the New York Exchange to adopt the experiment of the dual contract, since what would be called the "spinner's contract" would necessarily have to be dealt in only by a limited number of parties of either side, and the market would consequently be extremely narrow. Nothing further has been done by the New York Cotton Exchange towards establishing the so-called "spinner's contract."

Since the appointment of your committee, the New York Cotton Exchange has made very few changes in which we are interested. The elimination of all grades below good ordinary white, low middling tinged and middling stains from grades deliverable on contracts was for its betterment, but still leaves the contract with too wide a range of grades for the practical use of the spinner.

Quarter grades were also eliminated, but they will be reinstated in March, 1910. The reinstatement of quarter grades we regard as a concession to the seller, who under the present contract already possesses many advantages, multiplies unnecessarily grades and further tends to complicate deliveries.

It is a matter of report that the classification of cotton by the New York Exchange is more rigid, especially on low grade, sandy and gin-cut cotton, than heretofore.

We regret that the New York Cotton Exchange has not seen fit to change its system of fixed differences, which we think has an adverse effect on the parity which should exist between spots and future contracts. Our committee can but feel that the contract of the New York Cotton Exchange is far from what it should be, and is not such to encourage legitimate hedging in purchases and sales of cotton through the New York Exchange. The possibility of the manipulation of the market is very great under the present contract, and it is a pure question of chance whether the contract would continue in proper relation to spot cotton.

Your committee also visited New Orleans, and met with a very cordial reception from the committee appointed by that body to discuss with us the changes recommended by our association in the future contract on the New Orleans Cotton Exchange, and very decided changes and for its betterment have recently been made by this exchange.

The New Orleans Exchange has recently adopted a resolution providing for changes in the future contract and rules, which, in a great measure, complies with the recommendations of the Federal Government and of our committee, and we believe is a distinct improvement over their present method. The contract as now proposed by this exchange seems to us to approach very nearly to the ideal contract, and our committee feels that this association should express in the strongest terms its appreciation of the exchange meeting so closely the views of the association.

Among the most important changes are the following: The adoption of a system of certification of grades, carrying with it the official guarantee of the New Orleans Cotton Exchange, and the permanent identification of each and every bale. Classification by a salaried board of expert classers, having no other interest in the cotton business; such board to grade cotton only. The creation of an improved board of appeals. Improved arbitration of irregular and staple cotton. The compulsory use of the official standard of the exchange (which ultimately is to be the Government standard) by the board of clas-

sers. The adoption of a strict good ordinary clause, or its equivalent. Perpetuation of the commercial or market grade difference system as always enforced at New Orleans. The exclusion of all low-grade tinged and stained cotton from grades tenderable on contract.

An effort is also being made to provide better warehouse facilities. We commend the efforts of the Farmers' Union, and all other interests, in their efforts to provide better facilities for cotton, and would encourage producers to avail themselves of them, and thus avoid much useless loss to themselves and to us.

With reference to the so-called "uniform standard of classification," we commend the efforts made to establish this by law. While it may result in some confusion until the different markets of the country adjust themselves to the change, we think it would simplify and better the cotton business of our country, alike for producer, cotton merchant and spinner. In our own section, Augusta, Savannah, Charleston, Charlotte and Norfolk each have different standards. Of these, probably the most glaring difference is between Savannah and Augusta, middling cotton in Augusta being nearly equal to good middling in Savannah, and fully strict middling of the New York standard. This, of course, results in the Augusta quotations being higher for what they call middling as compared with middling prices in the neighboring towns.

New Orleans, Memphis, Houston and Galveston all differ in their standards, as do many minor markets, and unless personally familiar with the standards of each section, it is impossible to tell the value of cotton from the quotations. This is confusing to the producer and spinner, and nullifies market quotations to all the uninitiated.

"A bale of middling cotton should be a bale of middling cotton the world over," and when tenderable on future contract in one market should be acceptable for the same grade in another.

Then, too, if type samples could be furnished at small cost, so that they could be in reach of the producer and small buyer, the producer would gradually become familiar with the grades, and from the quotations be able to tell the value of his cotton in any market, and to that extent approach the ideal they so much desire—direct trade with the spinner.

A uniform standard would simplify arbitrations, and tend to prevent abnormal disturbances in the parity between spot and contract prices.

The ideal condition would be a uniform standard the world over, and we should lend our untiring efforts to that end.

A few weeks ago, the New York Cotton Exchange wrote the secretary of our association, asking that our committee advise it whether, in our opinion, the provision suggested, providing for the tender of round bales on the New York Cotton Exchange, would be wise. Every member of our committee was consulted, and the unanimous opinion, as expressed, was that none of the Southern mills used cotton in round bales, and that, therefore, the provision for the tender of round bales on the New York Cotton Exchange would depress the value of the contract and its usefulness to the members of this association, and we therefore recommended that the provision for the tender of round bales on the New York Cotton Exchange should not be made.

SOUTHERN TEXTILE ASSOCIATION.

The next convention of the Southern Textile Association will be held in Spartanburg, S. C., July 3. 1909.

The Southern Textile association is an organization of the superintendents, overseers, designers and master mechanics of the South. Its objects is education and development and it is in no sense a labor union. Every practical mill man who is eligible is urged to join.

E. E. Bowen, overseer of weaving of the Great Falls Mfg. Co., Rockingham, N. C., is the secretary. He is well known in mill circles in the Carolinas, having held the position of overseer of weaving and carding in several of the leading mills, traveling salesman for a leading mill supply house, and traveling representative of textile papers. He was one of the first men in the Carolinas to learn Jacquard weaving, and was with the Rosemary Mfg. Co., Roanoke Rapids, N. C., for several years as overseer of weaving of their Jacquard plant. At the time of his election as secretary of the association he was overseer of weaving for the Rhode Island Co., Spray, N. C., manufacturers of cotton blankets, which position he resigned to go on the road as traveling representative of textile paper.

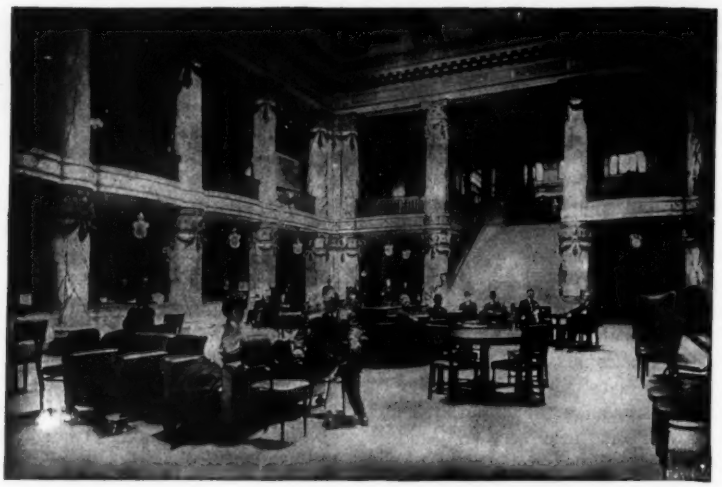
N. T. Brown superintendent of the Pilot Mills, Raleigh, N. C., is president; C. F. McCall, Greenville, S. C., first vice-president; W. P. Hamrick, Columbia, S. C., second vice-president; David Clark, Charlotte, N. C., treasurer.

The board of governors consists of E. E. Smith, chairman, Chester, S. C.; H. H. Boyd, Charlotte, N. C.; W. J. Danaho, Spray, N. C.; R. K. Matthews, Eatonton, Ga.; G. S. Escott, Charlotte, N. C.; W. J. Willett, Cooloomee, N. C.; Thomas Nelson, Raleigh, N. C.; J. T. Buff, Greenville, S. C.; J. F. Broom, Hope Mills, N. C.; Lewis F. Brown, Gaffney, S. C.; J. H. Cobb, Belton, S. C.; and J. B. Reid, McAdensville, N. C.

President N. T. Brown was born on a farm in Cumberland County, North Carolina, August 3d, 1866. In 1874 his parents moved to Hope Mills, N. C., a small cotton mill village. After spending three years in the public schools there, at the age of 11 he started to work for the Hope Mill Manufacturing Co., remaining with them until April 29th, 1897, during which time he worked through the mill. When 24 years of age he was made boss weaver and assistant designer, serving them in this capacity for seven years. In 1897 he was offered a position as boss weaver by W. H. Williamson, president of the Pilot Cotton Mills, at Raleigh N. C., which position he held for a little over two years, being promoted to superintendent at that time. He served in that capacity until December, 1901, at which time he accepted an offer of double the salary to act as superintendent of the Nantucket Mills at Spray, N. C. This position he held for two years, leaving of his own accord and going back to the Pilot Mills at Raleigh as superintendent for the second time. After about four years he was offered a very flattering salary to go back to the Nantucket Mills, so he went there and staid for about sixteen months.

On account of the great depression in business during the fall of 1907 he did not feel that he was doing justice to his employers to continue in their services at the same salary, so he decided to resign and return to Raleigh, where he is still located.

He attributes his success in life to the unfailing desire and effort on his part to discharge his full duty to his employer and at the same time to be just and considerate, though very firm with all those under him. He has tried always to be square in all his dealings with his fellow men.



THE LOBBY OF THE JEFFERSON HOTEL—CONVENTION HEAD QUARTERS.

In The Lobby.

The illustration at the head of these notes shows the lobby and office in the Jefferson Hotel, Richmond, Va. This hotel is situated on high ground in the most desirable residence portion of the city and can accommodate four hundred guests or more. The general surroundings of the hotel in its appointments show great refinement, making it one, if not the most beautiful hotel in the South.

Richmond is a treasure field of romance and history. Here linger the enduring and endearing memories of colonial days, of three great wars, and of earlier empires. This city is a half-way station on the highway along the Atlantic coast, of tourists and travelers journeying between the North and the South.

The American Cotton Manufacturers' Association is strongly in favor of a tariff commission as noted in the resolutions that were passed at this meeting. The association was represented at the national convention for a tariff commission at Indianapolis, February 18, 1909. D. A. Tompkins, of Charlotte, N. C., is the leading spirit in this movement, and seems to have back of him the sentiment of the association.

Take the tariff out of politics and take politics out of the tariff, was a popular idea that was expressed during the convention, but it is our belief that it will be a very difficult matter to accomplish this object as the tariff has been one of the great issues, if not the greatest, in political affairs since the foundation of our government, and politics and party platforms without the tariff issue in them would take the ginger out of national politics. The sentiment is good and most everybody endorses it, but how to accomplish the reform is something that has not yet been solved.

E. C. Smith, manager of the K-A Dept., of the Mossberg Wrench Co., Central Falls, R. I., says that the K-A electrical stop motion is meeting with favorable reception among a number of mills in the South.

G. M. Parks of the G. M. Parks Co., Fitchburg., Mass., was frequently seen in the lobby, and while ready to relate the merits of the turbo-humidifier and the successes with which it is meeting, never expressed an unkind word against other methods or criticised those of his competitors. He prefers to have his humidifier stand upon its own merits as shown in its practical utility.

We were pleased to meet J. B. Jamieson, cotton yarns, Boston, Mass. No one is more familiar with the yarn market than Mr. Jamieson.

We very pleasantly ran across John F. Conway who has charge of the cotton yarn department of the Farish-Stafford Co., New York. He says that the yarn market is not what it should be in order to make manufacturers and dealers good natured. He says that the coarse yarn manufacturers are suffering more than those on fine yarns. Good times, however, are coming as have always been the case following a period of depression.

R. R. Dancy of R. R. Dancy & Co., Houston, Texas, made some telling observations in the convention to the effect that Texas, especially the eastern portion of it, and Oklahoma will raise more cotton than many predict. He says that the reports of a prospective low yield are exaggerated, and spinners should bear this in mind in making their estimates of the coming crop. Mr. Dancy's statements were received with some surprise as spinners had come to the general conclusion that the Texas and Oklahoma crops would be unusually small this season. We will have to wait and see.

Hon. Harvie Jordan discussed in the convention and in the lobby, compression of cotton at the gin, and whatever he had to say was listened to with great attention as an authority whose observations and experience enabled him to speak ex cathedra. He said that Northern spinners were ready to pay a premium of $1.00 a bale for compression at the gin. We know this to be true, and spinners both in this country and abroad are ready to pay more than the regular market price, as a premium, or as an evidence of encouragement, for the baling of cotton at the gin of a density ready for transmission to points of destination.

F. H. Martin of the Textile Machinery Co., Boston, Mass., informed us that the Pacific Mills, Lowell, Mass., had in operation 13,000 Dunn flyers and the Majestic Mills, Belmont, N. C., have purchased these flyers for all of their roving spindles, and the president of these mills informs us that they are giving excellent satisfaction.

There was shown in an ante-room a model of the Neely cotton compress which attracted considerable attention on part of the members. This compress is intended to be used in connection with the gin, compressing the bale to a density of thirty pounds, more or less, per cubic foot, ready for immediate shipment to spinners.

The smoker that was given to the members and guests by the Richmond Chamber of Commerce in the auditorium of the hotel was a signal success in every way of a social nature. It was an entirely informal affair, presided over by F. D. Williams, president of the chamber, with the assistance of Vice-president John M. Miller, Jr., and Business Manager William Dabney, who received the guests and extended words of welcome from the platform when all had assembled. The chief feature of the evening was Polk Miller and his darkey quartet which entertained the company with songs, both new and old. Mr. Miller recited many negro stories. Palms and cut flowers decorated the hall, and on the platform was an orchestra alternating with Mr. Miller's quartet, the strains of the music at times bringing many to their feet in a dance, chairs being pushed back for this impromptu affair, many of the party coming from the galleries to take part. Refreshments were served on this occasion and the fun was kept up into the small hours of the morning.

A number of members intended to return home immediately after the first day's session, but finally concluded to remain so as to be present at the smoker and to take the steamboat sail down the James River.

President Rennie and Vice-president Parker were frequently the centers of a number of antimated groups of both men and women.

Frank B. Comins, vice-president and treasurer of the American Moistening Co., Boston, Mass., was greeted by many of his friends from the North and the South.

George Otis Draper did not arrive until the evening of the first day's session, but he was present at the second or last day's session, and took part in the proceedings relating to the endorsement of a tariff commission. He is not wedded to the commission idea.

Both Daniel J. Danker and J. P. Marston of Danker & Marston, Boston, Mass., were frequently seen in the lobby. Their sizing compound bearing the name of gum tragazol was highly commended by several manufacturers who were using it to the effect that it is all that is claimed for it.

E. S. Tennent, Spartanburg, S. C., had on exhibition a traveler economizer invented by a Mr. Cobb. This device will deliver a single traveler at a time and drop it into the spinner's hand, leaving no excuse for dropping travelers on the floor because the spinner has picked up more than is needed, for only one at a time can be secured. The device is attached to the spinning frame and is always conveniently at hand in this position.

U. S. Gutta Percha Paint Co., Providence, R. I., had on exhibition its manufacture known as Rice's Mill white, which furnishes an ideal permanent coating on ceilings and walls and remains a brilliant white with an enameled gloss finish. Light is reflected from it, dust will not adhere to it, a result impossible with ordinary paint, either lead or any cold water mixtures.

There is no member of the association who is more welcome at its meetings than Ex-president R. M. Miller, Jr., Charlotte, N. C. Mr. Miller is one of the very strongest men in the association, and an influential factor in its proceedings and course of action. In all of the affairs of the association his judgment is highly respected. He is president of the North Carolina Cotton Manufacturers' Association, and is a power in everything that pertains to the cotton industry of that state.

The Cardwell Machine Co., Richmond, Va., had on exhibit a working model of a hydraulic gin compress having two cylinders and a revolving floor which is made entirely of steel and iron, except the floor, with a large and powerful tramper. This press is made with a capacity of 200 to 400 tons.

M. H. Merrill, representing the Allis-Chalmers Co., Milwaukee, Wis., came to attend the convention from his headquarters in Boston, Mass. There is no one in the electrical transmission field more favorably known than Mr. Merrill. His circle of acquaintance is large.

Though John Hill, Atlanta, Ga., representative of the Lowell Machine Shop, Lowell, Mass., is a Georgian, he may be considered a representative of Southern cotton manufacturing interests as a whole. His operations are not confined to one state but cover the entire field.

The social features of a cotton manufacturers' meeting are always enlivened by the presence of Stephen C. Lowe, Boston, Mass. Mr. Lowe was in evidence upon all social occasions, and was a great favorite among the Richmond ladies as a dancer and otherwise.

T. Ashby Blythe, Philadelphia, of course, was on hand and was an important factor in the deliberations, in which his advice was highly regarded. He is a most valuable member and is always called upon when something is to be done.

We were highly pleased to meet the following gentlemen: Walter J. Leery, representing the General Electric Co., Philadelphia; Claiborne W. Godwin, representing E. S. Tennent, Spartanburg, S. C.; Theodore P. Bogart, representing several fire insurance companies, Providence, R. I.; and C. R. McCahey, representing the Morrison Machinery & Supply Co., Richmond, Va.

Harvie Jordan made the statement that jute bagging is particularly objectionable to cotton spinners if for no other reason than that the cotton lint sticks to it, much to the annoyance of fine spinners, especially, as any evidence of jute fiber mixed with cotton creates any amount of

trouble in the spinning. Mr. Jordan says every manufacturer either knows it or will admit it, as soon as his attention is called to it, and it seems strange that nothing has been done to improve the material used in the covering of cotton bales.

The Western Union Telegraph Co., notified the members of the association that all personal messages would be handled by the company free of charge.

The place for holding the next annual convention will be decided by the board of governors at a meeting to be held in July. Charlotte, N. C., is favored by a large number of the delegates. Atlanta, however, would be an ideal central spot, and no city in the South could handle a convention of a thousand or more better than this city. It is now recognized as the convention city of the South, because of is geographical location and accommodations.

Fifty-three new members have been added to the roll of the association since the last convention was held.

Apropos to the baling of cotton at the gin the following may be noted as the opinion of H. W. MacCalister, the chairman of the cotton contract commission of the international federation which has dealt with this subject, estimates that by compressing and baling cotton as proposed at the gin, not less than 3¼ million pounds sterling would be saved to the cotton trade annually.

Tariff protection to the cotton manufacturing industry in the United States was an universal sentiment among the members attending the convention. Protection for manufacturers of cotton goods was demanded from Congress, as noted in the resolution that was passed. These principles should apply to all other commodities manufactured in this country, that of affording protection to industries that are at a disadvantage in the way of cost of labor as compared with European trades. The tariff should be removed from party politics, and conditions should not be furthered by a "disreputable scramble amontg politicians in Congress."

New Orleans is after the convention for next year. Telegrams were received from the mayor of that city, and its board of trade and cotton exchange, inviting the association to hold its next meeting in that city.

Secretary Bryant's report showed an enrolled membership of 1,077, and the financial condition of the association entirely satisfactory.

While a general resolution demanding a protective tariff on cotton goods was adopted, the association tabled the resolution sent to it for acceptance by the National Association of Hosiery and Underwear Manufacturers, and adopted by the latter association, asking an increased duty on hosiery to beat German competition. There was too much party politics in it.

President Rennie believes that with the tariff question settled improvement in all lines of trade and commerce may be expected. He thinks that the schedule bearing upon the cotton textile industry does not present the wide diversity of expert and political opinions that has been shown elsewhere, and it can be taken for granted that this schedule of the Payne-Aldrich bill meets with the general approval of cotton manufacturers. In his opinion, the problem of adequate labor need not to be given serious consideration at this time, but with the growth of industrial enterprises in the South labor disturbances will surely follow, and ways and means must be devised to divert to this section the tide of immigration which now seeks homes where the opportunitie are not so great as here.

Thos. F. Parker, president of the Monoghan Mills, Greenville, S. C., is a great believer in welfare work among the employees of textile manufacturing establishments, as a business proposition as well as for the good of the people concerned. It is his idea that the level of labor efficiency in the South must be raised higher, especially for the manufacture of fine products and for an increased individual output. This is in harmony with the views of President Rennie, who believes that this can only be accomplished by widening our educational facilities along technical lines.

A. W. Smith, president of the Union-Buffalo Mills Co., Spartanburg, S. C., believes that the planter should be couraged in every way to improve the length of fiber and quality of cotton, and especially in the use of seed that will produce more uniform staple.

The ginning and baling of cotton was a live subject among those present at the convention. It was regarded as of the highest importance to the cotton manufacturing industry. Good results, however, can only be brought about by constant agitation and discussion and by a plan of education towards the improvement of methods.

A. W. Smith stated in the paper he read, that he believed it would be a good thing if manufacturers would all agree that they would not sell any bagging or ties in patterns, but would only sell by the pound to concerns that would tear up the old jute and re-weave it into new bagging. We would like to suggest to Mr. Smith that the best way would be to sell the old jute bagging for paper stock and not attempt to re-manufacture it into bagging which, at the best, would not make more than a shoddy fabric. Bagging made from new material is poor enough without trying to put on the market an inferior article from torn up material. Do not attempt to make the covering for cotton bales any worse by using old material, the best is none too good.

No one contributed more to the pleasure side of the convention than Walter L. Gordon, Richmond. The Richmond Chamber of Commerce was the host at the smoker given in the Jefferson auditorium, and the acquaintances that were formed there were highly appreciated.

The watch fob that was presented to President Rennie by the association had engraved upon it the seal of the association, with the date 1908, at which time Mr. Rennie was elected to this position.

The resolution in favor of a permanent tariff commission was interpreted by Mr. Tompkins as referring to a body that would sit as a court, that would take testimony and submit its findings in the form of a recommendation to the Congress of United States. In the opinion of many

that would be one of its worst features, of acting in any judicial capacity. Mr. Tompkins did not say that his ideas of such a commission necessarily involved functions of this character. They implied as much.

Lewis W. Parker, president of the Olympia Mills and several other mills, and the newly elected president of the association, declared that, as a Southern manufacturer, we did not get any benefit from a high protective tariff. He believed that if Southern mills can compete with the East, and on European soil, it stands to reason that they can compete on American soil, and need no protection. Still, he believes, as a national issue, in a customs tariff for protection of American industries.

The apparent consensus of opinion among manufacturers in attendance, was that a tariff commission should be a body of men appointed by the president, sitting all the time, gathering intelligent data from which schedules could be drawn.

It was a great compliment to the city of Greenville, S. C., that it should furnish a national association of spinners with a president, and with a chairman for its governing board.

Perhaps the greatest social feature of the city's entertainment was the trip for the members of the association down the James River to Jamestown Island on the steamer Pocahontas—the boat leaving at eight o'clock in the morning and returning by seven o'clock in the evening in time for the members to take the night trains in all directions.

Lewis W. Parker, the new president of the association was a practicing attorney at Greenville, S. C., ten years ago, at which time a cotton mill was organized and he was offered the presidency. The mill was located at Greer, S. C., and for a while he gave part of his time to the law and part to the mills. Subsequently, he became treasurer and practically the head of Monoghan Mills at Greenville. Some years later the Whaley group of mills in Columbia became involved financially, and against the advice of friends, Mr. Parker accepted the presidency of the four plants there. It was hard work. The four mills had a total of 108,432 spindles, while his mills in and around Greenville had 139,179 spindles, the total under his management being 247,611. The results, however, have justified the wisdom of stockholders and directors who put him in charge of the Columbia properties, for they have prospered greatly and are to-day on a fine paying basis.

Captain Ellison A. Smyth, of Greenville, S. C., who was elected chairman of the board of governors, is one of the pioneers in the South. Many years ago he moved from Charleston to Pelzer, S. C.

Charles K. Oliver, of Baltimore, who was elected vice-president, was formerly associated with the mills in Columbia, some years before Mr. Parker took charge there. He is president of the Mount Vernon-Woodbury Duck Company, a concern which controls twenty-six cotton mills, extending all the way from Nova Scotia to Texas.

Inquiries about anything pertaining to the textile industries will be cheerfully answered by COTTON.

NEW REGULATIONS OF THE NEW ORLEANS COTTON EXCHANGE.

FUTURE CONTRACTS. DELIVERABLE COTTON TO INCLUDE ONLY GRADES THAT ARE SPINNABLE, MERCHANTABLE AND DESIRABLE. ELIMINATE GOOD ORDINARY AND BELOW.

The New Orleans Cotton Exchange has recently adopted certain changes in the future contract and in the rules governing deliveries under the same. These changes, not only in the opinion of the members of the Exchange, but in the impartial, but critical judgment of the commissioner of Corporations of the Department of Commerce and Labor of the Federal Government, will secure to the trader fair treatment and satisfactory results, and to both the cotton producer and the manufacturer the great benefits of a just and uniform system of future trading.

THE CONTRACT.

It has been claimed that the value of the future contract, and consequently the value of the cotton for which the contract stands, has at times been depreciated by the fact that cotton of uncertain value and undesirable grade and quality could be tendered thereon. The argument in such case being that the buyer of the contract would sell is out at a discount before maturity rather than accept delivery of such uncertain and undesirable cotton and suffer a possible loss in the subsequent disposition of the same. This objection had been met in the proposed new rules eliminating from delivery on future contract all stained cotton below middling in grade and all tinged cotton below low middling and by still further eliminating from delivery cotton of the present type of good ordinary. This latter restriction will be accomplished either by making strict good ordinary on the present type the lowest grade deliverable, or by adopting permanent type standards in which good ordinary shall be the full equivalent of the present strict good ordinary grade. Thus limited, the range of deliverable cotton will include only grades that are unquestionably spinnable, merchantable and desirable, and cotton of a value readily ascertainable in the open market. The contract will, therefore, afford ample protection to the buyer, and will be entirely fair to the seller. It will offer no collateral inducements to the buyer or to the seller, but will properly serve as medium of transfer between the two.

PERMANENT STANDARDS.

The new rules require the adoption by the Exchange of permanent standards of grade. The rule heretofore has been that new standards were made each year out of the crop of that year. As the general character of a crop may differ in a small way one year from another, so the standards made from such different crops may so differ. This variation, although slight, gives rise to some uncertainty, and any uncertainty tends to affect the value and usefulness of the future contract. It is thought best to eliminate this element of uncertainty by adopting uniform and permanent standards. Under this rule middling cotton, for instance, will be exactly the same cotton one year with another, and so with all the grades. The trader will, therefore, suffer no misgivings that the standard in force at the time he liquidates his contract will be different from the standard in force at the time the contract was made. The Exchange purposes to adopt standards which shall prevail indefinitely, or until such

time as the State and Federal Government shall promulgate state of national standards of classification, in which event the Exchange will adopt such official standards.

CERTIFICATION.

The Exchange will institute a department of inspection and classification, the office of which will be to examine all cotton submitted to it and to determine whether or not the same is in merchantable condition or tenderable on contract; to class each bale of said cotton as is found to be merchantable and tenderable, and to issue a certificate of the grade of such cotton, and to guarantee the correctness of the classification. Not only will the correctness of the classification be assured by a pecuniary guarantee, but the parties submitting cotton for classification are still further assured by the rule making it a condition precedent that the classers employed by the Exchange shall have no interest whatever in any cotton business, nor shall they be interested in any other business than classing cotton for the Exchange on the type standard of the Exchange or of the Government, as the case may be.

LABOR LEGISLATION, 1908.

EMPLOYMENT OF WOMEN AND CHILDREN.

During the year 1908 sessions were held by the legislatures of 16 States, and by the Federal Congress. At each session (Kansas excepted), including also the session of the Federal Congress, one or more measures affecting labor were passed, the total number of such laws being 231, of which number 115 were new acts, 100 were amendments of or supplements to earlier statutes, eight were resolutions, six were appropriations for special purposes, and two were acts repealing earlier provisions, although many of the 231 measures contained clauses repealing earlier conflicting acts or parts thereof. The new measures passed during the year followed in most instances precedents already established by other States.

Notable among the labor measures of the year were the so-called "child labor laws" of Kentucky, Louisiana, Mississippi, Ohio, Virginia, and the Federal Law for the District of Columbia. These measures are designed to regulate particularly the employment of women and children in manufacturing and mercantile establishments, and by by their uniformity with measures passed by neighboring and New England States indicate a disposition on the part of the five States enumerated and the Federal Government to come into line with the general movement for legislation of this character. Some of these acts may be individually described, so far as relating to the textile industry, as follows:

Kentucky. No child under 14 years of age shall be employed in any factory; no child under 14 shall be employed in any business or service whatever during any part of the term during which the public schools of the district in which the child resides are in session; no child between 14 and 16 years of age shall be employed in any factory, unless an employment certificate, shall have been procured and filed; no child under 16 years of age shall be employed in any gainful occupation more than 60 hours in any one week nor more than ten hours a day in any one day, or, between 7 P.M. and 7 A.M.; females under 16 shall not be employed in any capacity where such employment compels them to remain standing constantly; employers are required to properly safeguard dangerous machinery, and no person under 18 years of age shall be allowed to clean machinery while it is in motion; suitable wash-rooms and closets are required, and the walls and ceilings in each room of any manufacturing establishment where children under 16 are employed shall be lime-washed or painted if, in the opinion of the inspector, it shall be conducive to the health of the persons working therein.

Louisiana. It shall be unlawful to employ any child under 14 years of age in any factory; no child under 18 years of age and no woman shall be employed more than ten hours a day or 60 hours a week, and one hour shall be allowed for dinner, or 30 minutes under certain conditions; no boy under 16 and no girl under 18 shall be employed between 7 P.M. and 6 A.M.; lists of employees under 18 and over 14 years of age must be posted by employers; seats must be provided for female employees, and dressing-rooms and conveniences are required; no minor or woman shall be employed in cleaning machinery while it is in motion; fans or other devices to remove dust, smoke, or lint are required where needed.

Mississippi. No child under 12 years of age shall be employed in any manufacturing establishment; no child under 16 shall be so employed more than ten hours a day or more than 58 hours a week or between 7 P. M. and 6 A. M., and no child under 16 shall be so employed without the consent of the parent or guardian; provision is made for inspection of such establishments and for enforcement of the act.

Virginia. No child under 13, and, on and after March 1, 1910, no child under 14 shall be employed in any mercantile establishment; this act does not apply to any child who is an orphan or who for any other reason is dependent upon its own labor for support, nor to any child whose parent is an invalid and solely dependent upon the labor of such child for support, in which cases certificates so stating must be secured before such child may be employed.

Massachusetts. The maximum number of hours in which children under 18 years of age and women employed in manufacturing establishments may be employed shall be reduced from 58 to 56 hours a week. This becomes effective January 1, 1910.

ALABAMA COTTON MILLS MAY BE INSPECTED BY WOMEN.

An informal meeting of the Alabama Cotton Manufacturers' Association, or a number of members thereof, was recently held in Montgomery. Is was agreed among those present that the mills should be open to the women of Alabama who are known to be working for the betterment of the laboring people whether engaged in cotton manufacturing or other pursuits. It was also the consensus of opinion of those present that is would be necessary for them to run mill schools during the summer time in order to comply with the child labor law, and the expense of these schools would have to be wholly defrayed by the cotton mills.

It is clear, in any heating system for mills, that pipes of a given area arranged as in the fan system where cool air passes through them very rapidly, are many times more efficient than a radiating surface of the same area exposed under ordinary conditions.

Nat'l Association of Hosiery and Underwear M'facturers

ANNUAL CONVENTION. THE CUSTOMS TARIFF QUESTION DOMINATED THE PROCEEDINGS. A PROTECTIVE TARIFF IS THE BULWARK OF LABOR AND NATIONAL PROSPERITY. PRESIDENT TAFT AND CONGRESS TO BE APPEALED TO FOR AN INCREASE IN RATES OF DUTIES. MEMBERSHIP REPRESENTS 80 PER CENT. OF THE INDUSTRY. PRISON LABOR SHOULD NOT BE AN ELEMENT OF COMPETITION.

The annual convention of the National Association of Hosiery and Underwear Manufacturers was held at the Continental Hotel, Philadelphia, May 11, 12 and 13th, two sessions being held each of these three days.

The morning of the first day was given to meetings of the various hosiery sub-associations and to a preliminary meeting of the underwear and fancy knit goods manufacturers, for the purpose of perfecting arrangements for the sub-division of their interests into sub-associations. The actual work of the convention, however, did not take place until late in the afternoon of the first day, which was given over to the annual report of the president, that of the secretary-treasurer, of the tariff committee, and of other committees. The full reading of the report of the secretary-treasurer was postponed until the second day to permit of the tabulation of certain financial figures. The report of President F. W. Simons was given almost wholly to the consideration of the customs tariff on hosiery and underwear, which subject, it may be said, dominated the transactions of the convention from the beginning to the end.

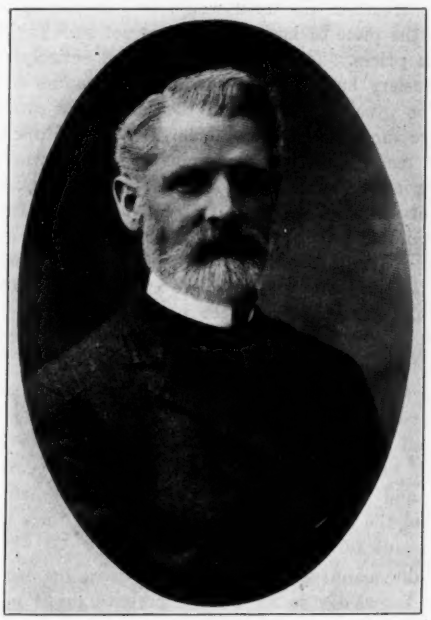
Mr. Simons said in part:

"Trade organizations ought to unite in conducting a regular campaign of education for the purpose of pointing out to American labor that it is a common sense proposition that the workman can not sell his labor in a protected market and spend his wages in a free market, and that in order to be prosperous they must be their own customers; must be consumers of their own products.

"What is consumption is the object of production anyway, and what is wrong with a policy that not only permits, but compels a people to reap the benefits of their own industry? I should be very much opposed to any effort that might be made to transform trade associations into political organizations, but the tariff question is not so much a political question as it is an economic question. The basis of our national prosperity is the high wages paid to American labor, and the only bulwark that can prevent that basis being swept to destruction is a protective tariff.

"I don't wish to take a gloomy pessimistic view of the future, but I can not escape the conviction that unless the friends of protection rally to their standard and start a vigorous campaign of education, to be carried on without intermission for the next three years, defeat will await us in 1912. And I am as sure as I am of my own existence, that a reversion to a low tariff policy will be destructive of our national prosperity.

"The danger in the present situation lies in the fact that many honest, intelligent men who are professedly protectionists do not thoroughly understand the principles underlying the policy, and become doubtful of their moral standing when some free trade orator or tariff reformer points to flagrant wrong-doing on the part of a trust or monopoly. They loose sight of the fact that protection does not make the thief, but only makes possible the wealth that tempts his cupidity. Money attracts thieves but you don't throw your purse away on that account. It is better to have a good dinner even if some one steals a little of it than it is to have nothing to eat.



PRESIDENT FRED W. SIMONS.

"This is a lesson that I fear the people of the United States have not yet thoroughly learned, notwithstanding their experience under the Wilson tariff, and every possible effort should be made to obviate the threatened necessity of undergoing another four years of business depression with the accompanying distress and suffering.

"This lukewarmness on the part of many protectionists is a real danger. It is true that as industrial development takes place in the South protection sentiment is rapidly gaining ground in that part of the country, but it is altogether unlikely that the protection party in congress will be greatly strengthened thereby for some time to come, whereas the retrograde movement in the middle West is undoubtedly sapping its strength. The sooner protectionists recognize that their real enemies are they of their own household the better it will be for the country"

Mr. Simons pointed out in his address that: The association now represents 75 per cent. of the hosiery and underwear production of the United States. He suggested several ways of improving its work. Among these he advocated an increase in the membership dues of large manufacturers, the establishment of credit bureau and the collection of statistics of interest to the trade.

Wednesday, the second day, there was held a general meeting of the association and also meetings of the various sub-associations. The tariff discussion was continued this day and was the most important subject that came before the convention. It resulted in the appointment of a special committee by the association to go to Washington to make arrangements for a subsequent visit of a large delegation of manufacturers to lay before President Taft and the senate reasons why there should be an increase in the rates of duties on imported hosiery. This committee consisted of J. B. Burton of Lynchburg, Va., Henry Pope of Chicago, and Jos. S. Rambo of Norristown, Pa. Mr. Burton in emphasizing the need of a higher tariff remarked:

"Opponents of the protective tariff make the assertion that an increase in the tariff would be followed by an advance in the price of hosiery. That is not so. Tariff does not make prices. The latter are regulated entirely, so far as the hosiery business is concerned, by genuine competition. The greater the demand the larger the production and hence the employment of a larger force of operatives. Another reason why there will be no increase in prices following an increased tariff is this: Hosiery purchased abroad at 40 cents a dozen, if it can be bought for that, costs the importer, in round figures about 96 cents a dozen to bring it into this market. This product is not one-half as good as the hosiery we sell here at 60 cents a dozen, so, therefore, the assertion is often proved false."

C. B. Carter, secretary-treasurer, read a report which we give in part as follows:

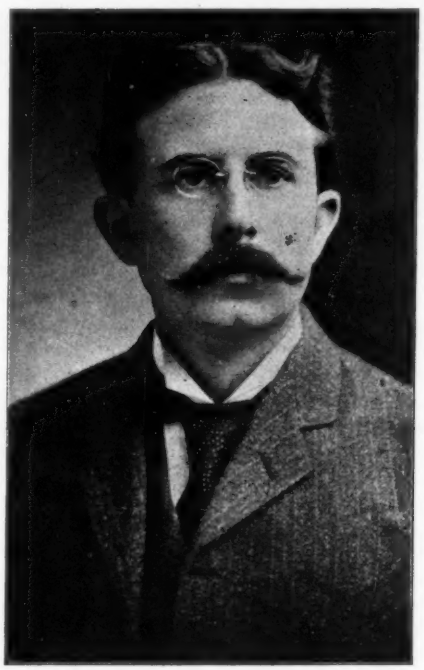
"The efforts of our association to secure for our members net weight terms upon yarns are progressing nicely. Additional converts to this up-to-date and proper method of doing business are being received. The dealers fully realize—and the spinners are beginning to awaken to the fact—that the knitters are now in earnest in their requests and demands for net weight terms.

"If the manufacturer does not possess the nerve nor has the knowledge to fix a remuneratitve profit upon the goods he produces nor is able to secure such results through co-operation with his fellow manufacturers, then there is little if any hope for the continuance of his business.

"It is also that inside and outside complications in a manufacturer's business causing worry and vexation will also prove detrimental to his welfare. Experience has shown most conclusively that a house divided against itself will fall sooner or later and the same is true along all lines. The point we wish to impress upon the knitting manufacturers most forcibly is that business practices and dealings should be transacted upon a plan conducive to confidence in their associate competitors and those who distribute their products.

"Complaints reach us from time to time from members stating that their efforts to eliminate the paying of expressage on samples has frequently been handicapped by intentional misrepresentations by the buyers. They come to the manufacturer with the statement that he is the only manufacturer insisting upon the elimination of this abuse. When met with the argument that many of the large manufacturers have also discontinued paying expressage on samples the statement is handed out to him that these large manufacturers freely allow expressage on jobbers' road samples. Nine times out of ten the buyer is mistaken, but the member taking the buyer's statement as a matter of fact, without investigating, frequently agrees to meet the reported conditions."

Mr. Carter's report showed that in the year, 64 new members had been added to the association, making a total membership of 350 manufacturers or 80 per cent. of the country's industry. To get these members "into the fold," Mr. Carter declared that he had travelled 11,045 miles.



SECRETARY C. R. CARTER.

Much attention was given to the question of prison made goods, which compete seriously with mill owners who make products of a similar character. The committee having this matter in charge stated that it believed the association should take steps during the coming year looking toward the elimination of this class of competition. As an example of this class of competition, the report stated that the Wisconsin prisons do their own printing, make their own paper boxes and wooden cases.

All looping done outside of the prison.

During 1908 average number of hands, 405 employed in all departments, knitting factory. Total income at 65c. per day, $80,392.

Contract is for 65c. per day per man employed; this includes, besides the man's labor, rent, heat, power, light and steam and water for dye-house, use about 30,000 gallons water per day.

The coal used by prison in 1908, nearly $10,000, and it is claimed over one-half of this was used for the knitting factory.

The guards required in the knitting factory cost the State about $10,000 per year.

The interest on investment of building, rent, wear and tear, water, etc., is estimated by me at $6,000 per year.

The total number employed in knitting factory at present, about 470; total number of prisoners about 730.

Average production required per convict men's 120 N hose, 17 doz.; children's 120 N large sizes, 12 doz.; children's small 5-5, ½ sizes, 14 doz.

What prisoners make over these amounts the contractors pay the prisoners 5c. per dozen for men's and 6c. per doz. for children's.

Men at drying and boarding board about 90 doz. per day.

Total income, $80,392; deduct for guards, $9,546.86; deduct for coal, $9,817.40; estimated deduction for rent, power, water, light, heat, wear and tear, and repairs, $6,000. Balance, $50,027.74.

Total number of prisoners, 630; total earnings per year, $80 per man; total earnings per day, 27c. per man.

The above competition, the committee declared, prevails in other States, and it was asserted that unless the matter be remedied there would be no telling what the competition would lead to. One plan suggested for the remedy of the matter was to have all the products of the prison mills labelled conspicuously so that every one shall know just what he is buying. In this way it is hoped to demoralize the prison trade and put it entirely out of business.

The proceedings of Thursday, the last day of the convention, was given to the election of officers and the discussion of unfinished business. The following resolutions were adopted as expressive of the views of the association on the tariff question:

Whereas, The large and continued importation of hosiery from Germany has made great inroads upon the hosiery industry of the United States, and besides the irreparable injury to the manufacturers has caused idleness to thousands of working people engaged in this branch of manufacture, proving conclusively that the present tariff rate is insufficient; and

Whereas, The present standard of wages should be preserved, so that the American standard of living shall not be lowered; and

Whereas, The issue now pending before the congress of the United States is of vital importance to the existence and continuation of our industries; and

Whereas, The Republican platform adopted at Chicago on June 18, 1908, stated clearly that "in all tariff legislation a true principle of protection is best maintained by the imposition of such duties as will equal the difference of cost of production at home and abroad, together with a reasonable profit to American industries;" and

Whereas, Upon this declaration and continued adherence to the policy and principle of protection, President Taft and the present congress were overwhelmingly elected; now therefore, be it

Resolved, That we, the National Association of Hosiery and Underwear Manufacturers, representing manufacturers in every State of the Union, in national convention assembled, again call and urge upon the President and the congress of the United States to give to the thousands of American manufacturers and working people engaged in the manufacture of hosiery and underwear, as well as their collateral branches, the full measure of protection promised in the Republican national platform and as outlined in the proposed "Payne" tariff schedule, without which the future and welfare of our industries and our working people will be seriously injured; furthermore, be it

Resolved, That copies of this resolution be presented to President Taft, Vice-president Sherman, and to each member of the congress and to the associated press.

The following amendments were made to the by-laws of the association:

Persons engaged in the manufacture of cotton yarns or cotton fabrics or the manufacture of textile machinery, supplies, or who otherwise cater to the patronage of the knitting manufacturer may become associate members of the association; the methods of application, nomination, election and withdrawal from the association being under the same conditions as those provided for active members excepting that this class of membership does not carry with it the privilege of attending executive meetings of the association.

The initiation fee for associate members shall be $25 and annual dues of $25.

Honorary members may be elected, when recommended by the executive committee, at any regular meeting of the association, who shall be enrolled as such, and shall be entitled to attend the meetings of the association and participate in its proceedings, without the right to vote. They shall not be subject to payment of administration fees or assessments.

The following officers were elected to the association for the ensuing year:

President, Frederick W. Simons of Simons & Struve, Frankford; first vice-president, Park Moore of the Brown-Moore Hosiery Co.; second vice-president, H. S. Weihenmayer of the Blue Ridge Knitting Co., Hagerstown, Md.; secretary and treasurer, C. B. Carter. Executive committee: Ernest Blood, Sr., of John Blood & Bro.; George B. Pfingst of the Lee Hosiery Mills; W. F. Carr; Earl Thissell of the Lowell Hosiery Co., Lowell, Mass.; W. H. Diefenderfer of the Auburn Knitting Mills, Auburn, Pa.; Garnett Andrews of the Richmond Hosiery Mills, Chattanooga, Tenn.

As the tariff question was the dominating feature of the convention, the following article, which recently appeared in a New York daily paper, may be read with much interest as expressing the views of a manufacturer of hosiery concerning tariff duties and questions relating thereto in controversy before the senate committee and congress. This communication reads as follows:

"What are the facts about the controversy over the tariff on hosiery? Why have women in certain sections petitioned congress against an increase in duties on hosiery, and why have women operatives in the hosiery mills appeared here asking for the increased duties? Would the addition of 15 per cent. in duties justify retailers of stockings in advancing the prices of such articles 10 cents or 15 cents a pair?

"The answers to these important questions about the hosiery business and the tariff may be summarized as follows: The United States makes nearly all the 10 cents and two for 25 cents a pair grades of socks and stockings. This country also provides itself at present with an amply supply of silk hosiery, though it is threatened by severe competition from Japan before long. Already on the grades retailing from 25 to 50 cents it has to meet heavy competition from Germany, nearly 13,000,000 pairs having been imported in the first three months of this year. The imported 25 cents goods cost $1.70 per dozen pairs, duty paid. The same grade manufactured in this country cost $1.90, a difference of 20 cents a dozen, or 1 2-3 cents per pair. The Payne bill equalized this by adding the additional 1 2-3 cents of cost to the imported article. As these goods, costing $1.90 per dozen, already retail at $3, it is obvious that the additional 20 cents can not fairly be added to the price charged the consumer, for whom the

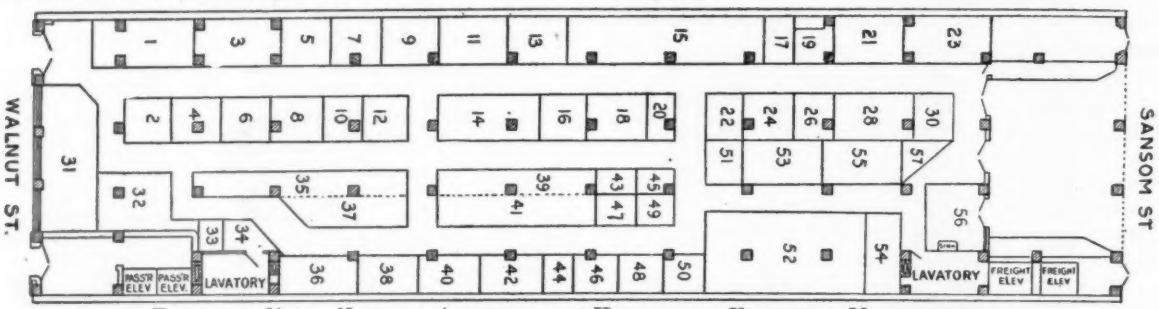
25-cent price is almost as fixed as the 5-cent price of bread, but must be taken from the profits of the middlemen.

"The result of the tariff will be, it is claimed, a very large increase in the home industry, which is a particularly valuable one, as it provides employment with comparatively small investments for the women in small communities. A considerable percentage of the 150 American hosiery mills are particularly co-operative, being run with local capital invested in small amounts to provide work in the home town for self-supporting women who are too ambitious to enter domestic service."

LIST OF EXHIBITORS.

	Booth
Association Headquarters	20
Arguto Oilless Bearing Co., Philadelphia, Pa.	42
Ballard Electric Cutter, Philadelphia	54
Charles Beck Paper Company, Limited, Philadelphia	18
Beckert Needle & Suply Co., Germantown, Phila.	49
Berlin Aniline Works, New York	4
Charles Bond Co., Philadelphia	48
Cassella Color Co., New York	42
Cigar Stand	20
Climax Machine Co., Philadelphia	47
Continental Latch Needle Co., New York	44
The Credit Office, New York	38
Diehl Mfg. Co., Philadelphia	37
Dry Goods Economist, New York	45
General Electric Co., Schenectady, N. Y.	26
Grosser Knitting Machine Co., New York	41
Harding & Fancort, Philadelphia	16
Hemphill Mfg. Co., Pawtucket, R. I.	11
E. Jenckes Mfg. Co., Pawtucket, R. I.	3
Kaumagraph Co., New York	10
H. Maimin, Philadelphia	51
Manufacturers' Supplies Co. Philadelphia	8
Geo. D. Mayo Machine Co., Laconia, N. H.	39
Mayo Knitting Machine & Needle Co., Franklin, N. Y.	7
Merrow Machine Co., Hartford, Conn.	6
Metropolitan Sewing Machine Co., Nyack, N. Y.	13
National Laundry Machine Co., Dayton, Ohio	5
New England Cotton Yarn Co., Boston, Mass.	53
Edwin A. Newton, Philadelphia	34
Nicetown Dye Works, Philadelphia	2
Nonotuck Silk Co., Philadelphia	33
Paxton & O'Neill, Philadelphia	1
Philadelphia Drying Machinery Co., Germantown, Phila.	31
Reception Booths	18, 56
Roessler & Hasslacher Chemical Co., New York City	32
Scott & Williams, Philadelphia	52
A. H. Seemuller & Co., Philadelphia	22
Smith, Drum & Co., Philadelphia	28, 30, 55, 57
S. C. F. Machinery Co., Nashville, Mich.	14
Singer Sewing Machine Co., New York	35
Southern Textile Machinery Co., Paducah, Ky.	24
Standard Machine Co., Philadelphia	36
James Taylor, Philadelphia	9
Textile Machine Works, Reading, Pa.	14
Textile Manufacturers' Journal, New York	50
Textile World Record, Boston, Mass.	43
Tolhurst Machine Co., Troy, N. Y.	46
United States Hoffman Co., Syracuse, N. Y.	23
United States Truck Co., Philadelphia	54
Universal Winding Co., Boston, Mass.	53½
Wildman Mfg. Co., Norristown, Pa.	17, 19, 21
The O. F. Zurn & Co., Philadelphia	12

A French cloth may show a more woolly surface than one produced in Great Britain, a feature which at once suggests that the former is from yarns prepared by a distinct system.



EXHIBITION HALL—NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS.

COTTON SPINNERS OF THE WORLD IN SESSION.

SIXTH ANNUAL CONVENTION OF THE INTERNATIONAL FEDERATION OF MASTER COTTON SPINNERS' AND MANUFACTURERS' ASSOCIATION, AT MILAN, ITALY. SUPPLY OF RAW MATERIAL IS INSUFFICIENT. DEPRESSION IN MANUFACTURING, THE SEQUENCE OF OVEREXPANSION. A SCHEME TO REGULATE PRICES. AREA OF COTTON CULTIVATION, AND MILL OPERATION.

About 400 delegates, representing nearly all of the cotton-growing and cotton-using countries in the world, met in Milan, Italy, last month, it being the sixth annual convention of the International Federation of Master Cotton Spinners' and Manufacturers' Association.

The convention was presided over by Baron Costanzo Cantoni, who welcomed those assembled, after which C. W. Macara, chairman of the international committee, addressed the meeting on the work of the federation during the year and the progress made in the cotton industry.

Mr. Macara said, in part:

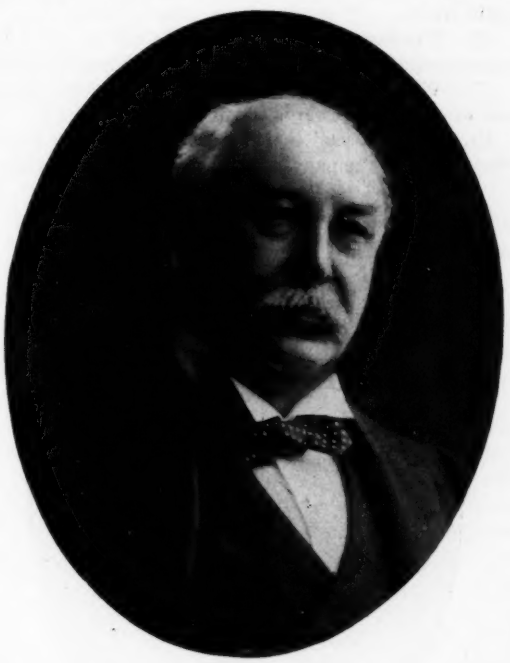
"We have had ample proof during the last ten years that the supply of raw material is not only precarious but insufficient, and I think the gratitude and practical support of all engaged in the cotton industry are due to those pioneers, to whatever nationality they may belong, who have striven to broaden the area of supply and safeguard the trade from the vicissitudes of the past.

The depression in the cotton industry which had commenced at the time of the last congress has considerably deepened; indeed, the losses of those engaged in it are as exceptionally severe as the profits were exceptionally good in the previous years. This state of things is the natural sequence of the overexpansion which invaribly accompanies a period of prosperity. It is most unfortunate for both capital and labor that the experiences of the past seem to be entirely overlooked at such times and that former errors are repeated. I am in favor of any united action which might be taken to try to prevent a recurrence of extending the productive power of the industry beyond the probable requirements of the trade, which conditions renders the trade unprofitable for all engaged in it—a state of things which tends to jeopardize its efficiency.

"From long observation it has been calculated that the cotton industry of the world is developing at the rate of 2½ per cent. per annum. When the International Federation was inaugurated in 1904 the spinning spindles of the world were estimated at about 105,000,000. These figures, of course, exclude doubling and waste spindles which are often erroneously included in statistics of cotton-using spindles.

"The number has now risen to about 135,000,000 spinning spindles, either running or in course of construction. This increase of 30,000,000 in five years is more than double the estimated increased requirement if judged by the past. It is difficult to overestimate the seriousness of the present position, and unless the situation is dealt with by organized effort the outlook is by no means a bright one. In considering this increase of production there is one factor which is often overlooked, viz., although well kept up and liberally depreciated old mills are in a strong position for competing successfully with new mills, which necessarily stand at a high capital value, the fact remains that for various reasons a number of old mills are broken up each year, and this is accentuated during periods of depression. A resolution was adopted at the Paris Congress affirming that whenever there is a lack of the raw material or the supply of the manufactured article begins to exceed the demand in any country, the adoption of short-time working is the only real remedy, and requesting all the associations in the cotton-using countries to perfect their organizations in order to put into operation short-time working whenever it might be considered necessary. This method of dealing with the vicissitudes of the cotton industry has been so successful during recent years and has made such an impression throughout the world that there are comparatively few countries in which it has not been adopted. This is all the more remarkable, as when it was proposed at the initiation of the International Federation in 1904, it was a policy that did not meet with much favor outside England. It is to me, therefore, a matter of profound regret that the English Federation of Master Cotton Spinners should have under existing circumstances failed so far to secure the requisite majority to curtail the production on an organized basis. I know that short time operates somewhat unfairly in its working; for example, the loss entailed by the spinners of fine counts is much greater than by those spinning medium and coarse counts, but from the standpoint of the welfare of a great industry and of the community that is so largely dependent upon that industry, as well as of the bringing about of the equitable distribution of the losses sustained both by the employers and operatives during a period of depression, I think that all ought to fall into line, as by this means an improvement of the whole trade is rapidly effected in which all would participate."

We are unable to devote much space to the proceedings of this convention, in this issue, but give below, because of its importance and suggestive features, a fairly full report of a paper presented by John Swethurst, secretary of the federation, discussing the scheme presented at the Bremen congress, in 1906, by E. Lang of Switzerland. The scheme contemplates the formation of an organization or limited company, comprising the entire cotton business of the world, to buy a quantity of cotton of the most required grades, prices and quantities to be fixed by the spinners themselves by means of votes of delegates. It also proposes the payment of a fixed levy for every bale of cotton used in the mills of the members, the proceeds to defray expenses of management, and the payment of



C. W. MACARA.

an indemnity to those who adopt "short time" if it should not be possible to establish the cotton reserve either entirely or partially.

The three main purposes of the scheme as elaborated by Mr. Lang are:

(1) To prevent excessive fluctuations in prices beyond certain fixed limits.

(2) To increase the area of cultivation by assuring the planters of a minimum price for at least a portion of the crop, and

(3) To make international short time more easy of adoption by the payment of an indemnity to firms adopting short time when the price of cotton is so high as to make short time working desirable.

Mr. Lang's scheme was submitted to the executives of the various associations with a view to ascertaining:

(1) Whether in their opinion the guaranteed minimum price for the co-operative purchase of 1,000,000 bales of American cotton would act as a stimulus to cotton planters,

as soon as they see that the existing acreage is not large enough.

(2) Whether this guarantee would by offering a certain protection against too great a depreciation in value, facilitate the establishment and maintenance of large visible and invisible stocks.

(3) Whether the cotton reserve would be inductive to a more regular and equal supply, and whether by selling the reserve at times of insufficient crops a cotton famine might be averted.

(4) Whether, in case of the non-existence of a reserve, the short time system could be easily introduced by means of the large funds at disposal, so that a general introduction of "short time" and consequently a limitation of the cotton consumption could be accomplished.

(5) Whether the collecting of a levy or premium of about 1s per bale for defraying the expenses would be possible, and which mode of collecting (direct from the spinner or through the cotton exporter or merchant) would be preferable.

(6) Whether the regulating of the market could also be accomplished in a similar manner for Egyptian cotton.

(7) Whether any modifications of the scheme are desired or appear necessary, and if so what they are.

Mr. Swethurst said that the "scheme provides for the formation of a company composed of individual spinners,

JOHN SWETHURST.

who will contribute annually a sum of money for each bale of American cotton consumed in their mills. It is believed by Mr. Lang that if the scheme is to be successful it would have to be adopted by firms using 10,000,000 bales of American cotton per year. In this I agree and am strongly of opinion that unless there was a practically unanimous adoption of the scheme it would be unwise to attempt to put it into operation.

"Assuming that such a company had been formed, it would be necessary to fix the minimum price at which the 1,000,000 bales are to be bought and the maximum price at which same should be sold. The prices suggested by Mr. Lang for the purpose of illustrating the principle of the scheme only, are a minimum of 4d and a maximum of 6d. The executive committee or directors of the company would, under the provisions of the scheme, be absolutely bound to accept every lot of suitable cotton until they had bought up 1,000,000 bales on the basis of 4d for middling. They would also be obliged to sell this cotton whenever the prices reached 6d. I think it may reasonably be expected that the fact of its being common knowledge that an organization was prepared to place 1,000,000 bales on the market immediately cotton was run up to a certain figure, would at any rate have some influence against the price exceeding that figure and would also have an influence against prices going below the minimum.

"The question of the expense in connection with the co-operative purchase and holding of 1,000,000 bales is, of course, a very important one, and I think that in the following calculation Mr. Lang has erred on the right side.:

	Per Cent per annum.
Interest at	3½—4
Warehousing insurance and (if the cotton is stored for many years) exchange	1½—2
Staff	¼— ½
Total	5¼—6½

"A million bales of American cotton at 4d per pound would cost approximately £8,000,000, and reckoning as above at 6 per cent. per annum, the expenses for the holding of the reserve would be £480,000 per annum.

"Mr. Lang assumed that this cost would be distributed over the users of 10,000,000 bales, and the levy to be paid therefore would be, approximately, 1s per bale, or ½ per cent. on the value of the bale. I do not think that the system of calculating the amount of levy to be paid by bales is the fairest method, as applied to our continental colleages. It is well known that the amount of cotton used per spindle is much greater on the Continent than in England and consequently the burden of the expenses would fall more heavily on them than on the English spinner. A fairer method would be to reckon by spindleage. However, let us for the moment apply the scheme to an English spinner on the basis of, say, 1s per bale.

"Take a mill of 100,000 spindles using, say 10,000 bales per year. Such a firm would be required to pay £500 per year, or, roughly speaking, ½ per cent. on the price of its cotton. Now let us further assume that the 1s per bale has been paid and the reserve of 1,000,000 bales has been bought at 4d per pound. The price, however, during the particular year in which the cotton has been bought does not reach 6d and consequently the reserve is not sold. The question the spinner would naturally ask himself would be, what benefit have I received by the payment of 1s per bale? and he might be disposed to answer that he had received no benefit; but in so answering I think he would overlook the fact that by the payment of his money along with other spinners he had achieved one of the objects that the scheme had in view, viz., the prevention of the price being run up beyond the maximum figure. The payment of his money would mean that so far as humanly possible he had insured himself against an excessive price of the raw material. He might again argue that by the payment of 1s per bale amounting to £500 per year, he had to that extent increased his cost of production. In such an argument it should not be forgotten that it is assumed that the users of 10,000,000 bales are parties to the scheme, being practically the whole of the cotton spinning industry

on American cotton, and it does not require any great stretch of imagination to assume that the cost of production having been increased, not simply at an individual mill but at practically all mills, a corresponding increase would be made in the selling price of the finished article. This being so the spinner himself would in the first place bear the cost of the premium per bale, but it would ultimately fall, as it does in every other case, on the consumer.

"Again, let us assume that having bought, say, in the year 1910, 1,000,000 bales on the basis of 4d and during the season the price reached 6d. It would, of course, be binding on the executive or directors of the company to sell the reserve, in the open market. But, it may be asked, to whom will they sell. Seeing that practically the whole of the trade are members of the company, the members would be buying from themselves cotton at 6d, for which they had paid 4d. This is perfectly true, but by selling of the 1,000,000 bales at 6d, a fund would be created out of which firms joining an international organized short-time movement might be indemnified, and it is fair to assume that the fact of there being such a fund out of which spinners could receive financial assistance would be a ready means for inducing many firms to adopt short time, who, on account of the expense, are not at present disposed to adopt such an expedient. If not disbursed as short-time payments, the money resulting from a sale at 6d could be placed to a guarantee fund or dealt with in such a manner as the members from time to time thought advisable.

"Take another case, and let it be assumed that in 1910 the spinners by their premiums paid into the coffers of the company a sum of £500,000 (10,000,000 bales at 1s), but during that year cotton did not reach the minimum price, and consequently there was no purchase. The fund so created would again be available for use as an indemnification in the case of firms running short time, and in the course of a few years, in the event of the minimum price of 4d not being reached, such yearly payments would provide a fund which would enable the International Federation to overcome some of the existing difficulties regarding universal or international short time working.

"There is another contingency, and a most important one, to be faced. An argument previously used has been on the assumption that having bought at 4d, the price goes up. It may, however, happen (although not very probable, judging from the experience of recent years) that the price of cotton might go down below 4d, say to 3d, and its value as a security to the financing banks would be correspondingly and seriously reduced. It is not, however, conceivable that cotton would remain at such a low price for any lengthy period. To provide for such a contingency, Mr. Lang admits the necessity of creating a guarantee fund which would serve as a guarantee to the banks finding the money for the cotton reserve. He goes on to state that at a purchase price of 4d the cover of 1d, that is to say cotton at 3d per pound, should be quite sufficient for this guarantee fund, or in money figures £2,000,000. Mr. Lang is of the opinion that this money could be easily obtained if 4 or 5 per cent. dividends were promised. While the money might not have to be actually paid in, it would be necessary for firms not so paying to give promissory notes for the amount. This, I think, will be found by some to be a serious objection to the adoption of Mr. Lang's scheme, and it seems to me that the only feasible way of putting the scheme on a solid business footing and to provide for all contingencies, would be for the proposed organization to be a limited liability company. In this case the amount of the uncalled capital might be considered as a guarantee to the bank in the event of the price depreciating after a purchase had been made at 4d.

"I think it should not be too hastily assumed that the scheme is impracticable. I am prepared to admit that there are tremendous difficulties in the way of inducing the spinners of the world to adopt such a scheme; but I believe that if it could be put to a practical test many of the objections now raised would be found to be without solid foundation. There is a growing feeling that if a reserve could be held by spinners, it would be a very good thing for the trade.

"I, therefore, respectfully suggest to the International Committee that they should propose the appointment of a small special commission for the purpose of considering the practicability or otherwise of the scheme. The duty of such a commission would be to consider:

(1) Is the scheme as outlined by Mr. Lang practicable?

(2) If not, could any modifications of the scheme be made which would render it practicable?

CONVENTION OF COTTON INTERESTS.

The convention of cotton spinners and manufacturers in Milan, Italy, is deserving of consideration on the part of the cotton producing and cotton consuming world, as the proceedings are being distinguished for the views of some of the wisest and most thoughtful exponents of the several interests concerned in the cultivation, distribution and manufacture of cotton, which is the raw material for the clothing of most of the people on the earth.

These conventions of international import are growing in their significance and consequence to the cotton world in all of its phases. The one at Atlanta, in 1907, sowed seeds with fructifying power that is becoming visible, and effective in arousing the opinion and actions of planters, merchants, transportation companies and spinners to the necessity of improvements and the importance of studying the community of interests that naturally exists between them and which should be promoted and made effective. Even the seeming impracticability of some of the schemes, for improving conditions, that are advocated before these conventions are entitled to some attention, as, for example, the one persistently proposed by one of the delegates from Switzerland, at the Bremen congress, in 1906, and at subsequent congresses, and to which reference is made elsewhere in this issue, for increasing the cultivation and regulating the consumption of cotton. These oftentime are rich gems embedded in mire.

The ring or traveller should never be oiled. If the traveller does not run properly, it may be caused by the ring being loose or not set level, or possibly the ring may be worn.

Fifty-two knitting mills in North Carolina show an aggregate authorized investment of $2,919,260 and the employment of 73,968 spindles, 6,232 machines and 5,078 horse-power. The total number of employees is 5,152, of whom 1,497 are male and 2,903 are female adults.

COTTON MANUFACTURING

THE MAKING OF A THREAD.

SPEED FOR CERTAIN CLASSES OF YARN. PREPARING AND FINISHING OF SEWING, ETC., YARNS. THE SCOTCH SYSTEM. TRAVELERS.

BY SAMUEL WARD.

1st Honors Silver Medalist and Clothworkers' Company Prize. Lecturer in Cotton Spinning.

Part V.

The following particulars will convey a general idea of the speeds, etc., for certain classes of yarn.

Counts.	Diam. of Rings	Lift.	Calculated Speed
120-2 to 80-2	1½"	5"	8500
8.-2 to 50-2	1¾"	5"	7500
50 2 to 30-2	2"	5"	6500
30-2 to 24-3	2¼"	5"	5500

Speeds for other folds can be shown by noting their equivalent to the above thickness. Below the last counts or its equivalent in 2, 4, 6 or other folds, slower speeds on flyer frames are essential.

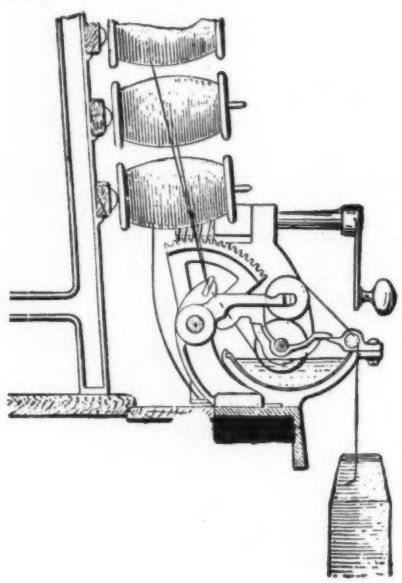


FIG. 22.

The maximum speeds of flyer frame spindles for twisting corresponding counts never exceed three-fifths of the ring frame speeds allowing 5 per cent. for slippage between calculated and actual speeds for ring frame and 3 per cent. for flyer frames.

A difference of 2 per cent. in the actual twists in the two systems is accounted for in that the flyer is positively driven whilst the traveler is pulled around by the yarn.

Counts below 3-fold 24s to be twisted on the ring frame should have a reduction in speed of 300 to 500 revs. per minute on account of the increased drag caused by the heavier traveler.

Preparing for sewings or crochet yarns from 2/120s to 2/16s are best done on a doubler made on the Scotch system, see Fig. 22, at a maximum speed as shown above, but if they exceed 120s counts the English system, Fig. 12A (February, page 149), is preferable.

The finishing of 3-cord sewings from 22s downwards, and of all coarse 6-cord ought to be done on flyer frames and worked to the following particulars.

FLYER FRAMES.

Counts.	Lift.	Gauge	Wharve on Spindle	Speed of Spindle.
2-120s upwards	1¾" or 2"	2¼"	1" or 1⅛"	5000
2-60s to 2-110	2"	2¼"	1⅛"	3500 to 4000
2-40s to 60s	2⅛"	2½"	1¼"	3200 to 3600
2-30s & downwards....	2⅛"	2¾"	1⅜"	
4, 6 and 9 cord sewings and crochet	3" or 3½"	3½"	1¼"	3000
6, 9 and 12 cord heavy sewings	4"	4"	1¾" to 2"	2500
Coarser	5"	4½" or 5"	2" to 4¼"	1600 to 2000

Fine numbers are twisted on the ring frames for lace purposes for cheapness of production, but the yarn is not so good in quality as that produced on the flyer frame.

The highest limit for two-fold warping or gassed yarns on ring frames should be placed at 2/120s. The drag band is used for counts as low as 60s and even lower by firms making for a well concentrated thread.

The preparing and finishing of sewings, crotchet, etc., (other than fine or coarse numbers,) are most commonly and economically produced on the Scotch system.

The following list of travelers for wet doubling gives good results. As the lightest travelers considered workable, commercially, are 24s, the table commencing at 2/120s the counts which the writer regards as the utmost limit the ring and traveler are capable of working efficiently is graduated down to 10s/2-fold, or its equivalent 15s/3 or 30s/6 cord.

RING 1½". 8300 REVOLS. OF SPINDLES. USUAL TWIST.

180s/3-fold or 120s/2 24s traveler
160s/3-fold or 110s/2 24s traveler
150s/3-fold or 100s/2 23s traveler
140s/3-fold or 90s/2 23s traveler
120s/3-fold or 80s/2 22s traveler
110s/3-fold or 70s/2 21s traveler
90s/3-fold or 60s/2 20s traveler

RING 1⅝" OR 1¾". 7500 REVOLS. OF SPINDLES. USUAL TWIST.

150s/3-fold or 100s/2 23s or 22s traveler
140s/3-fold or 90s/2 22s or 21s traveler
120s/3-fold or 80s/2 22s or 21s traveler
100s/3-fold or 70s/2 21 or 20 traveler
90s/3-fold or 60s/2 21s or 20s traveler
80s/3-fold or 60s/2 20s or 19s traveler
70s/3-fold or 50s/2 19s or 18s traveler
60s/3-fold or 40s/2 18s traveler.

RING 2". 6500 REVOLS. OF SPINDLES. USUAL TWIST.

90s/3-fold or 60s/2 21s or 20s traveler
70s to 80s/3-fold or 50s/2 20s or 19s t'r
60s/3-fold or 40s/2 19s or 18s traveler
50s/3-fold or 36/2 18s traveler
40s/3-fold or 32s/2 18s or 17s traveler

RING 2¼". 5500 REVOLS. OF SPINDLES. USUAL OR SEWINGS TWIST.

45s/3-fold or 30s/2	18s traveler
36s/3-fold or 24s/2	17s traveler
30s/3-fold or 20s/2	16s traveler
24s/3-fold or 16s/2	15s or 14s t'v'ler
20s/3-fold or 14s/2	14s or 13s t'v'ler

RING 2½". 4000 REVOLS. OF SPINDLES. SEWING TWISTS.

60s/6-fold or 30s/3 or 20s/2	16s or 15s traveler
50s/6-fold or 24s/3 or 16s/2	15s or 14s traveler
40s/6-fold or 20s/3 or 12s/2	14s or 13s traveler
30s/6-fold or 16s/3 or 10s/2	13s or 12s traveler

It will be observed that the above tables are recommended for usual twists only, for counts 30s/2 and upwards.

For soft and extra soft twists one or two counts lighter travelers are required.

For hard two-folds or twist on twist as in preparing for sewings one or two counts heavier travelers must be used to prevent shrinkage.

The shrinkage due to twist is very great in hard-twisted yarns and a heavier traveler is necessary to prevent this tendency.

For example 48s to 50s 2-fold gassed lisle should have 30 turns actual, but a traveler, such as is suitable for these counts when soft twist, would be altogether unsuitable as if the frame started at 31½ turns calculated the actual twist may be found to be 33s instead of 30, having in fact 1½ turns more instead or less than calculated. Too light travelers are therefore capable of causing hard and shrunk yarn.

Sometimes in twisting soft and very delicate yarns it is necessary to reduce the speed of spindle as the only way to prevent injury to the yarn.

PLAIN CLOTH.

BY SANDERSON W. HAYS.

The definition of plain cloth given in COTTON, November, 1908, and the definition given by the National Association of Cotton Manufacturers are so clear to both technical and non-technical readers that no effort will be made by the writer to give any other.

It is well known that there is as much skill and ingenuity exercised in the designing of plain as in the making of the majority of fancy cloths, but such work does not usually fall to the man at the mill. The construction for plain cloth is often defined by the buyer, or the selling house, or a piece of goods is sent to the mill with instructions to make a sample of a determined width, reed and pick, and weight. This leaves the counts of the warp and filling for the mill to decide, keeping in mind the appearance of the cloth required, or by sampling and weighing the warp and filling in the cloth submitted and calculating the weight of each.

If we consider a few of the varieties of plain cloth made, we may realize to some extent the skill that has been exercised to make some dozen different kinds of print cloths with warp yarns from 24s to 36s, and filling from 28s to 40s of carded cotton.

Organdies for printing and white goods made of combed yarns from 60s to 100s, and combed filling from 70s to 140s, and each cloth averaging from 16 to 17 yards per pound.

Victoria lawns from 40s to 100s warp, and filling from 40s to 120s, with average of nine yards per pound.

Swiss linens (cotton cloth by the way) from 72 ends and 60 picks, to 100 ends and 120 picks, each, to average from 14.50 yards to 16.00 yards per pound. India linens with warps from 65s to 110s, and filling from 65s to 160s, and average 10 to 14 yards per pound. Nainsook from 80 to 128 ends per inch, and picks from 84 to 176 per inch, and cloth from eight to nine yards per pound.

Besides those mentioned are scores of varieties for different purposes, and each and every kind has to have more or less of a special finish.

As the simple easy weaves of fancies are useful it has been decided that the two cloths below may be of some interest.

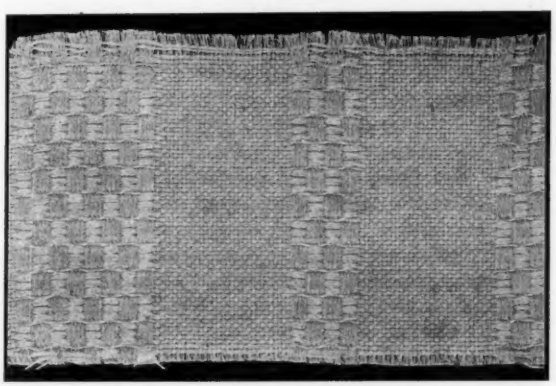
TWO BASKET WEAVES.

Cotton cloth on two basket weaves is a very good cloth for waists, in wide patterns as shown here, and in narrow strips for shirtings.

A good construction is to use a 72 reed (one giving 72 ends per inch on yarn drawn two in a dent), and from 60 to 72 picks per inch, warp yarns from 30s to 40s, and about 16s filling. The pattern is rather large to give a full repeat, but it will readily be understood by reference to sections numbered 1, 2, 3 and 4, and the particulars given in the column below the weave, drawing-in draft, and pegging plan.

Section No. 1—Selvage No. 124 ends, 2 in eye, 4 in a dent, 6 dents.

The drawing-in draft does not show the reed plan as that is given in full as follows:



Pattern:

No. 2	Repeat 15 times, 90 ends, 3 in eye, 3 in dent, 30 dents								
" 3	"	1	4	"	4	"	"	4	" " 1 "
" 4	"	4	128	"	4	"	"	4	" " 32 "
" 2	"	15	90	"	3	"	"	3	" " 30 "
" 3	"	1	4	"	4	"	"	4	" " 1 "
" 4	"	2	64	"	4	"	"	4	" " 16 "
			380 ends in pattern						110 dents

Two warps are required to get the best results as the number of intersections of filling are so unequal. Draw shafts 1, 2, 3, 4 and 9 from bottom warp, and shafts 5, 6, 7, 8, 10, and 11, from top warp.

To find number of ends in 28-inch goods proceed as follows:

72 reeds × 28 = 2016 ÷ 2 ends in dent of plain cloth = 1008 dents.

Next 1008 ÷ 110 dents = 9 patterns and 18 dents left over.

Of these 12 dents will be required for selvage and the 6 dents left, may, in a cloth of this nature, be discarded, as the spread of the reed will keep the cloth to the full width, hence there are 9 patterns and selvage.

For bottom warp:

Shafts Nos. 1 and 2 selvage	24 ends	× 2 =	48 ends
" Nos. 3, 4 and 9 =	200 ends	× 9 patterns =	1800
Total in bottom Warp			1840

For top warp:

Shafts 5, 6, 7, 8, 10, 11 =180 ends × 9 patt, = 1620 ends in top warp

The cloth can be woven on nine instead of eleven harness as shown, but the number of needles required on each shaft with only nine harness would have a tendency to chafe the warp yarn and the percentage of production would be less than if eleven shafts were used.

After bleaching, the cloth should be finished about 27 inches wide, and slightly starched and calendered, which gives a linen effect to the goods.

CASSIMERE TWILL.

This is a cloth made of double and twist cotton warp and worsted filling. In all cotton goods this makes a good fabric when woven 40 inches wide, 56 ends and 60 picks per inch, warp to be made of 2/24s twist, one end white and one end olive. Filling 1/14s olive, average about 2.12 yards per pound.

FIG. 1

FIG. 2

A CRETONNE STYLE OF FABRIC.

There is shown here (Fig. 1) a cretonne style of fabric which has proved very satisfactory when printed for summer cottage furnishings such as door draperies, pillow covers, etc. The construction is 36 inches wide, 72 ends per inch, 28s warp, 60 picks per inch, 20s filling. Cloth averages 3.90 yards per pound. The colors used should be bright and clear. A very effective construction is 36 inches wide, 60 ends per inch, 24s warp, 40 picks per inch, 10s filling. This increases the size of the pattern, and for a dobby pattern makes a beautiful fabric if properly finished. This construction is mercerized before printing, and the cloth has a soft silky texture that appeals to buyers when printed in ceramic effects.

For white goods for waists or shirtings, the construction is 32 inches wide, 76 to 80 ends per inch, 40s warp, and 84 to 88 picks per inch, 36s to 40s filling.

The pattern repeats itself on 24 harness and 48 picks, but smaller effects may be made on the order of this design by using as a base a different twill weave, the cloth under notice being filling float over five ends. Smaller designs are necessary where the dobbies available have a smaller number of levers, but for upholstery purposes would not be so desirable as the cloth made on 24 harness.

ANOTHER CRETONNE.

Fig. 2 is a cretonne made on 12 harness and 16 picks, woven 44 ends per inch, 28s warp, and 36 picks per inch, 6s to 7s filling, averaging about 2.85 yards per pound. This is suitable for large floral effects in dark colors as well as bright rose and hollyhock patterns.

SIZING COMPOUNDS.

BY CHARLES L. EPPLEY.

The subject of making a sizing compound and applying it to the yarn is a very important one that requires a great deal of attention. All that I shall say are facts practiced daily under my own observation.

When I first started in the mill business I ran a weave room and began to experiment on the sizing of warps and tried most every kind of compound there was on the market. Sometimes I would get a good material and then at other times would get bad stuff that would tear up my work and make it run bad. This caused me to get in the way of experimenting. I would get different kinds of chemicals and mix them in the compound I was using, and I would carefully notice their effect on the yarn.

My experimenting resulted in the following formula which I consider the best there is on the market to-day: Soluble oil 30 pounds, glycerine 30 pounds, Japan wax 30 pounds, turpentine 20 pounds, kerosene 20 pounds, chloride of magnesium 20 pounds, linseed oil 20 pounds, alum 6 pounds, gum tragacanth 6 pounds. Soak the gum tragacanth in 100 pounds of water 24 hours, put 200 pounds of water in the kettle and dissolve in it 60 pounds of starch. Boil 20 minutes then add the other ingredients. Boil very hard 30 minutes then pour out into barrels and stir with a paddle occasionally until cooled. Use 20 to 100 pounds of starch and one will get good results. The best feature about making one's own compound is that one always knows what he is using and can make it to suit his work.

In sizing yarn to get the very best results, we must have a compound with a penetrating force that will go right into the yarn and carry the substance with it so as to make it run well. We must have a sufficient amount of warp softener and the softening ingredients should have a penetrating force about them. That is the reason why so many people have quit using tallow as this will soften

the yarn, but it does not have the penetrating force about it. Tallow wants to stay on the outside.

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No.	*Grs.*	*No.*	*Grs.*	*No.*	*Grs.*	*No.*	*Grs.*	*No.*	*Grs.*
5	1400.	29	241.5	53	132.1	77	90.9	105	66.7
6	1166.6	30	233.4	54	129.7	78	89.7	110	63.6
7	1000.	31	225.8	55	127.3	79	88.6	115	60.9
8	875.	32	218.8	56	125.	80	87.5	120	58.3
9	777.8	33	212.2	57	122.8	81	86.4	125	56.
10	700.	34	206.	58	120.7	82	85.4	130	53.8
11	636.4	35	200.	59	118 6	83	84.3	135	51.8
12	583.3	36	194.6	60	116.7	84	83.3	140	50.
13	538.5	37	189.3	61	114.8	85	82.4	145	48.3
14	500.	38	184.3	62	112.9	86	81.4	150	46.7
15	466.8	39	179.6	63	111.1	87	80.4	155	45.2
16	437.5	40	175.	64	109.3	88	79.5	160	43.8
17	411.9	41	170.8	65	107.7	89	78.6	165	42.4
18	389.	42	166.7	66	106.1	90	77.8	170	41.2
19	368.5	43	162.8	67	104.4	91	76.9	175	40.
20	350.	44	159.2	68	102.9	92	76.1	180	38.9
21	333.3	45	155.6	69	101.4	93	75.3	185	37.8
22	318.3	46	152 2	70	100.	94	74.5	190	36.8
23	304.5	47	148.9	71	98.6	95	73.7	195	35.9
24	291.8	48	145.8	72	97.2	96	72.9	200	35.
25	280.	49	142.8	73	95.9	97	72.3		
26	269.3	50	140.	74	94.6	98	71.4		
27	259.3	51	137.3	75	93.3	99	70.7		
28	250.	52	134.7	76	92.1	100	70.		

To ascertain what Number of Cotton Yarn will be produced from a given Sliver of Drawing or Roving.—Measure off a convenient number of yards of sliver or roving. Multiply this number by the product of all the drafts of all succeeding machines including the spinning head; and divide the product so obtained by 2 if there is one doubling, by 2×2 if there are two doublings, by 2×2×2 if there are three doublings, and so on, then multiply the quotient so obtained by 8⅓ and divide the product by the weight of the sample in grains. From this result a deduction must be made for the contraction produced by twisting. The amount of this deduction varies with the twist and tension, so that no simple rule will be correct for all cases.

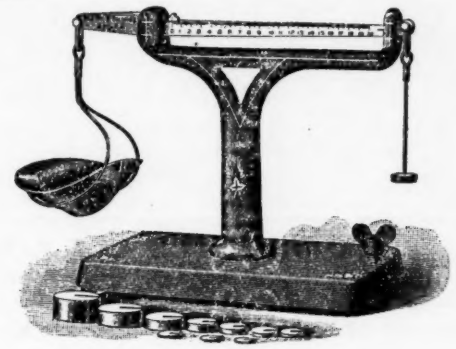

FIG. 1

As an average one may make this deduction equal to 9 per cent. for slivers from drawing frame, and 6 per cent. for roving ready for spinning. The easiest way to do this is to multiply by .91 for slivers, and .94 for rovings. *Example.*—Suppose two yards of sliver weight 50 grains; drafts of slubber=5, do of fine roving frame=6, do. Spinning head=7, and one doubling on fine roving frame. Then product of drafts=5×6×7=210. 2 yards×210=420. Divide 420 by 2 for one doubling and we have 210. 210×8⅓=1750; and 1750÷50=35, and 35×.91=31.85. Say 32=the number of the yarn which will be produced. Again: Suppose 40 yards weigh 72 grains and draft of spinning head=7, then 40×7=280, and 280×8⅓=2333.33, and 2333 33÷72=32.4 and 32.4×.94=30.46. Say 30½, the number of the yarn which will be produced.

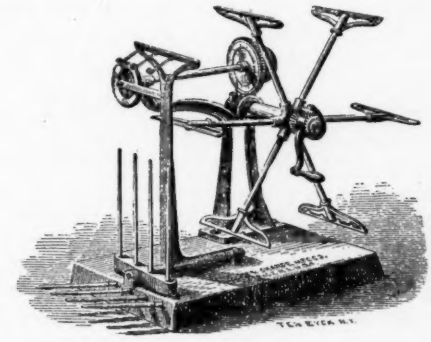

FIG. 2

To determine the number of hanks and decimal parts of hanks to the pound avoirdupois, for carding, drawing, slubbing, roving and yarn, according to a given number of yards reeled or measured—Multiply the number of yards by 8⅓, and divide by their weight, the quotient will be the hanks and decimal parts of hanks required. To determine what weight a given length of drawing, slubbing, roving and yarn should be, to equal a given number of hanks, and decimal parts of hanks required—multiply the given number of yards in length by 8⅓ and divide by the

72 reeds × 28 = 2016 ÷ 2 ends in dent of plain cloth = 1008 dents.

Next 1008 ÷ 110 dents = 9 patterns and 18 dents left over.

Of these 12 dents will be required for selvage and the 6 dents left, may, in a cloth of this nature, be discarded, as the spread of the reed will keep the cloth to the full width, hence there are 9 patterns and selvage.

For bottom warp:

Shafts Nos. 1 and 2 selvage	24 ends	× 2 =	48 ends
" Nos. 3, 4 and 9 =	200 ends	× 9 patterns =	1800
Total in bottom Warp			1840

For top warp:

Shafts 5, 6, 7, 8, 10, 11 = 180 ends × 9 patt, = 1620 ends in top warp

The cloth can be woven on nine instead of eleven harness as shown, but the number of needles required on each shaft with only nine harness would have a tendency to chafe the warp yarn and the percentage of production would be less than if eleven shafts were used.

After bleaching, the cloth should be finished about 27 inches wide, and slightly starched and calendered, which gives a linen effect to the goods.

CASSIMERE TWILL.

This is a cloth made of double and twist cotton warp and worsted filling. In all cotton goods this makes a good fabric when woven 40 inches wide, 56 ends and 60 picks per inch, warp to be made of 2/24s twist, one end white and one end olive. Filling 1/14s olive, average about 2.12 yards per pound.

FIG. 1

FIG. 2

A CRETONNE STYLE OF FABRIC.

There is shown here (Fig. 1) a cretonne style of fabric which has proved very satisfactory when printed for summer cottage furnishings such as door draperies, pillow covers, etc. The construction is 36 inches wide, 72 ends per inch, 28s warp, 60 picks per inch, 20s filling. Cloth averages 3.90 yards per pound. The colors used should be bright and clear. A very effective construction is 36 inches wide, 60 ends per inch, 24s warp, 40 picks per inch, 10s filling. This increases the size of the pattern, and for a dobby pattern makes a beautiful fabric if properly finished. This construction is mercerized before printing, and the cloth has a soft silky texture that appeals to buyers when printed in ceramic effects.

For white goods for waists or shirtings, the construction is 32 inches wide, 76 to 80 ends per inch, 40s warp, and 84 to 88 picks per inch, 36s to 40s filling.

The pattern repeats itself on 24 harness and 48 picks, but smaller effects may be made on the order of this design by using as a base a different twill weave, the cloth under notice being filling float over five ends. Smaller designs are necessary where the dobbies available have a smaller number of levers, but for upholstery purposes would not be so desirable as the cloth made on 24 harness.

ANOTHER CRETONNE.

Fig. 2 is a cretonne made on 12 harness and 16 picks, woven 44 ends per inch, 28s warp, and 36 picks per inch, 6s to 7s filling, averaging about 2.85 yards per pound. This is suitable for large floral effects in dark colors as well as bright rose and hollyhock patterns.

SIZING COMPOUNDS.

BY CHARLES L. EPPLEY.

The subject of making a sizing compound and applying it to the yarn is a very important one that requires a great deal of attention. All that I shall say are facts practiced daily under my own observation.

When I first started in the mill business I ran a weave room and began to experiment on the sizing of warps and tried most every kind of compound there was on the market. Sometimes I would get a good material and then at other times would get bad stuff that would tear up my work and make it run bad. This caused me to get in the way of experimenting. I would get different kinds of chemicals and mix them in the compound I was using, and I would carefully notice their effect on the yarn.

My experimenting resulted in the following formula which I consider the best there is on the market to-day: Soluble oil 30 pounds, glycerine 30 pounds, Japan wax 30 pounds, turpentine 20 pounds, kerosene 20 pounds, chloride of magnesium 20 pounds, linseed oil 20 pounds, alum 6 pounds, gum tragacanth 6 pounds. Soak the gum tragacanth in 100 pounds of water 24 hours, put 200 pounds of water in the kettle and dissolve in it 60 pounds of starch. Boil 20 minutes then add the other ingredients. Boil very hard 30 minutes then pour out into barrels and stir with a paddle occasionally until cooled. Use 20 to 100 pounds of starch and one will get good results. The best feature about making one's own compound is that one always knows what he is using and can make it to suit his work.

In sizing yarn to get the very best results, we must have a compound with a penetrating force that will go right into the yarn and carry the substance with it so as to make it run well. We must have a sufficient amount of warp softener and the softening ingredients should have a penetrating force about them. That is the reason why so many people have quit using tallow as this will soften

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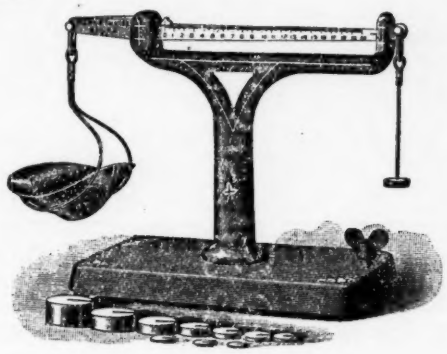

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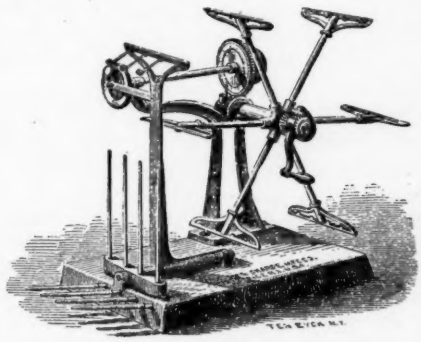

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number of hanks and decimal parts of hanks required, the quotient will be the weight of the given length of drawing, etc.

In Fig. 1 is shown an improved roving or yarn scale. This scale will weigh one pound by tenths of grains, or one seventy-thousandth part of one pound avoirdupois, rendering it especially well adapted for use in connection with yarn reels, for the numbering of yarn from the weight of hank, giving the weight in tenths of grains to compare with tables. Ten balancing weights accompany each scale, viz.: one each of 20, 30, 50, 100, 200, 300, 500, 1000, 2000 and 3000 grains; the 20 grains on the beam being each divided into 10 parts.

In Fig. 2 is shown a yarn reel for use in connection with roving scales and yarn testers for obtaining the stretch, strength and number of yarn. The reel is 54 inches, or one and a half yards, in circumference. The dial is graduated into 120 parts, indicating the number of yards reeled from each spindle. The yarn guides and spindles are kept in line with each other while feeding yarn upon the reel, which is very desirable when reeling fine yarns. The extra length of yarn guides is of use in increasing the friction upon the yarn by taking a half turn or more of yarn around them. The *automatic feed motion* lays the yarn flat upon the reel, thus securing accurate and uniform measurement, and consequently correct results as to stretch, strength and numbering.

The bright spot on the web of the worm wheel is to show when the zero upon the dial approaches the index point, and thus assists the operator to stop promptly on the striking of the bell.

WOOL MANUFACTURING.

THE USE OF COTTON IN THE WOOLEN MILL.

THE TESTING OF COLORS TO INSURE GOOD RESULTS, ETC.

BY O. F. IRELAND.

To procure full bright colors and clear mixtures in the finished cloth, it is very important that the staying qualities of the cotton colors can be relied upon, and it must be borne in mind that these colors will seldom stand as well as the wool colors when subjected to the test of fulling and scouring.

While the wool colors generally stand the fulling, and not infrequently are improved by it, the cotton colors are bound to be reduced in shade to some extent, and to avoid trouble, some should be discarded altogether. Aside from the fugitive nature of the colors, there is often a tendency for some colors to run into and stain the lighter shades, thereby causing very serious trouble. As the wool has no affinity for the cotton dyes, it is seldom if ever the wool is affected by the floating cotton colors; but the lighter shades and white of the cotton are liable to be seriously affected by them.

To avoid as far as possible the evil effects, it is advisable to give all the cotton colors a fulling and scouring test, to make sure of their stability, before making use of the stock.

If the cotton to be matched with wool of similar color is decided upon as they both come from the dyer, it may seem a good match; but it will be found that the stock has been fulled and scoured, the cotton, in some instances will have lost its original fullness of shade, so that it will cause the combination to have a mixed appearance instead of a good full and even color. In order to avoid this, it is necessary to match the fulled and scoured cotton with the wool, having it match after it has been fairly tested. Take the cotton as it comes from the dyer, and put it through the regular process of fulling and scouring, and then if it is a good match, a good full color will result in the finished goods. In other words, match the cotton to the wool in the shade it will be after the test, and not as it is from the dyer.

When testing the cotton for shade, it will be well also to test it as to its running tendency, to know if it is likely to stain the white and lighter shades in the finishing process.

When the test is made, put some white cotton with the colored, and see whether the white comes out clear and bright. If it stains from the darker color, the latter should be discarded to avoid trouble later on. The best way to do the testing is to take the colored cotton to be tested and twist a small portion with an equal amount of white, inclose them in a piece of white cotton cloth, sewing them in, and then attach them to cloth that is to be fulled and let them remain through the regular fulling and scouring processes; then it will be subjected to the same treatment it will have to stand when it is put into the fabric.

Every cotton color to be used should be tested; and it will be found an advantage to keep a special sample book, in which to preserve, side by side, each color as it appears before and after testing, and if desired, the white that was tested with it, to show the result of staining.

The simple washing of samples to ascertain the stability of the color is not sufficient, for many colors will stand a severe test of washing that will not stand the heat and pressure of fulling, which is the real test required.

Some times a slight stain from blue or black will give a blue effect to the white that is not objectionable; but any stain from brown, red or green always produces a bad effect.

Of course when a color is found to be unsuitable for use, it is up to the dyer to produce it from some other formula that will give better results. Since "an ounce of prevention is worth a pound of cure," too much pains can not be taken to insure the stability of the colors.

In making the fulling tests, the samples should be attached to as light colored goods as possible, or better still to all wool goods, so that the samples will not take any stain from the cloth.

By following this system regularly, and testing every cotton color as soon as it is made, the wool can be compared with the tested samples in the book and the right combination made with perfect assurance of full, bright and clear colors in the finished cloth.

The cotton is best concealed and the color most satisfactory where the shade is a trifle darker than that of the wool, while if it should be lighter, it at once gives a bad and "mixy" effect.

It will be well to bear in mind that even with good colors, an excessive fulling will cause a "flattening out" of the

colors. For this reason the designer should take into consideration the combination, as the greater the percentage of cotton used, the narrower should the cloth be laid in the loom. Nothing is more detrimental to the cloth than to have it forced or worried up in fulling.

By making sure beforehand of the shade that the cotton will be when finished, and guarding against the possibility of staining, there is no reason why a cotton mixed cloth may not be clear and bright; while if the work is done by a dependence upon the shade and appearance of the unwashed cotton as it comes from the dyer, it becomes a mere matter of chance, with the odds greatly against the possibility of good results. So it becomes a matter of the utmost importance that the above system of testing be carried out, thus insuring certain success, so far as the clearness of the colors are concerned.

THE ADVANTAGES AND DISADVANTAGES OF STEAMING WOOLEN YARNS.

BY "CROSSBRED."

It is a well-known fact that when a woolen thread is twisted the tendency for the fibers to untwist is something that can not be helped, but effect every detail in the processes which enter into the manufacture of a textile fabric. There seems to be a regularly exerted effort, on the part of each individual fiber in the yarn, to untwist and resume its natural position.

On account of this fact it happens that if a thread breaks in the weaving process, the only way to satisfactorily cover up the imperfection is for the weaver, before he ties the knot, to carefully retwist the broken ends of the thread. If the end was not thus retwisted the loosened fibers, where the break has occurred, would be quite apparent on the surface of the finished cloth.

When dealing with certain finishes, this defect becomes a serious injury. For example, in certain colored doeskin finishes the defect would produce an entirely different pattern, or, at least, a change in pattern sufficient to be quite noticeable.

In order to avoid this class of defects, and procure a yarn which in all circumstances will maintain its twist, the steaming of the yarn before the weaving takes place, is the plan adopted. If the yarn has been steamed, and then it happens to break, there is no necessity for the weaver to retwist the ends before he ties them. The steaming has the effect of fixing the twist, and setting it in such a way that it maintains its position no matter what happens.

The advantage of a yarn of this description in the finished appearance of a fabric, is quite evident. It has a firmness and solidity about it that is unmistakable, and imparts to the surface of the cloth a feel and handle that it can receive in no other way. The loose twisted fiber that is always in danger of getting back to its original position has a full and fluffy feel that, in certain grades of goods, is detrimental to the finish.

If we had any desire to make the strength of the yarn an important feature in the quality of the goods, there is no way in which it can be attained so easily and inexpensively as by steaming the yarn. The steaming process has the effect of interlacing or inter-twining the various fibers of the yarn in a firmer way, so that it requires more strain to pull them apart or untwist them. The strength of the fiber in also increased by reason of the fact that the substance of the wool fiber itself, is swelled under the action of the steam. These reasons are sufficient to account for the added strength of a steamed yarn.

On the other hand, while the strength of the yarn is increased, its elasticity is somewhat decreased. The same reasons that have been given for the increase in yarn strength, might be given for the decrease in yarn elasticity. Some have thought that this peculiarity is due to the fact that a sort of glue or gluey substance is formed by the influence of the steam on the stearin contained in the lubricant. There is some doubt as to whether this is a correct explanation. The elasticity of a wool yarn is due to the curl of the fiber, and to the peculiar laminated formation of the microscopic scales on the fiber surface. For these reasons it happens that when a yarn is stretched or its fibers uncurled, if the strain is released, the straightened fibers will at once resume their normally curled positions. Since the steaming swells the fiber, and more firmly interlaces it with its neighbors, it naturally requires more strain to uncurl or unlace it. This, of course, means that its elasticity has been decreased.

The strength of a steamed yarn will vary, somewhat, according to the length of its staple. A short staple yarn will gain less in strength than a long staple yarn. If a tester is used, it will be seen that a short staple yarn will never gain less than 12 per cent., while a long staple yarn will sometimes gain as much as 20 per cent. The strength is thus so substantially increased that, in certain kinds of wool, it is possible to dispense altogether with the sizing of the warp. This, of course, decreases the expense and produces at the same time a style of finish which is quite superior.

It is frequently considered to be the case, that the steaming of woolen yarn has an injurious effect upon the fulling capacity of the wool fabric, and that when it is practiced on heavy woolen goods, it is going to decrease the felting qualities of the cloth. This is a natural inference from what has already been said, and yet although the steaming does add to the strength of the yarn and detract from its elasticity, it is nevertheless true that the felting process is not appreciably affected. If the steaming is done with hot dry steam, and at too high a pressure, or if the yarn is subjected to it for too long a time, then there may be danger to the felting process. In order to avoid all risk, the use of a reducing valve in the supply pipe of steaming apparatus will be perfectly satisfactory, since in this way the steam supply and pressure can be regulated at will. If a pressure not exceeding an atmosphere and a half is used, and if the time of exposure is not over three to five minutes, there will be difficulty in the operation of fulling.

It is commonly urged that the steaming of white yarn produces a yellow tinge, and the same on light colors is supposed to produce a change in shade.

This will depend altogether on the method and style of treatment. In many cases it will be found that where these results are produced, it is due to processes that have already taken place. In other cases, a steam pressure too high or too hot or too long prolonged, will undoubtedly produce these undesirable results.

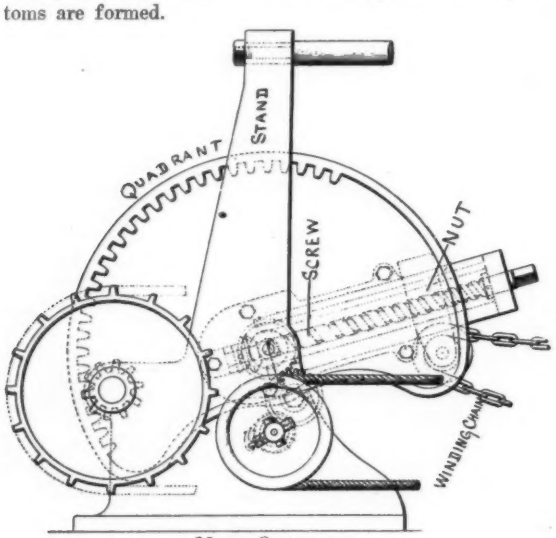
In dealing with light colors, care should be exercised never to expose the yarn for a longer time than is necessary to simply penetrate all parts of the yarn completely. Indeed, a steam pressure too long continued would injure even dark colors. Generally two to three minutes will be

sufficient. The lubricant that is used for light colors or white yarns must be carefully chosen. Mineral oils must be avoided entirely, and no oils with acid traces, or with acid reactions must be used at all. Olive oil and oleine are ordinarily the most satisfactory, when dealing with colors that are at all sensitive.

QUADRANT MECHANISM FOR A WOOLEN MULE.

The accompanying illustration relates particularly to the quadrant mechanism of a woolen spinning mule provided with a screw turned by a so-called feed-motion including an endless band or rope actuated by or through the carriage; a quadrant-nut co-operating with the screw and having a sheave over which passes the winding chain connected with the spindle-driving drum, and means to oscillate the quadrant with a constant throw throughout the winding of a set of cops.

The quadrant-screw is rotated from time to time during the formation of the cop bottoms, the nut starting at its lowest position at the beginning of the winding, the automatic rotation of the screw being effected by the feed motion, which is governed by the tension and winding fallers, the upward movement of the nut ceasing when the cop bottoms are formed.



MULE QUADRANT.

At the completion of the winding of a set of cops the quadrant-screw must be turned backward by the operative in order to wind the quadrant nut down to its starting position, and ordinarily this involves the expenditure of considerable strength in order to overcome the friction and inertia of the feed motion connected with the quadrant screw.

The mechanism has for its object the production of means whereby the feed motion is automatically brought into operative engagement with the mechanism which effects the travel of the quadrant nut on the screw, whenever a movement of the nut is required, at any point on the inward run of the carriage, and automatically disconnected from such mechanism by or through the manual winding down of the quadrant nut. That is, the feed motion is connected automatically with the mechanism for effecting the requisite travel of the quadrant nut when such travel is necessary, so that when the winding down of the nut is effected by the operative there is very slight exertion required, as the feed motion is disconnected by the initial reversal of rotation of the quadrant screw. Inasmuch as the feed motion is thrown in automatically when required there is no chance of breaking down the ends by failure of the operative to render the feed motion operative after winding down.

The drawing shows a side elevation of a sufficient portion of the quadrant mechanism of a spinning mule to be understood, with one embodiment of the machine applied thereto, the feed motion being thrown out.

THE CITADEL OF PROTECTION.

Senator Aldrich declared in the Senate, during the debate on the tariff, that "the assault on the wool and woolens schedules is an assault on the very citadel of protection. The woolen schedule was the keystone of protection. Remove it and the whole system would tumble. The undervaluations of which importers had been guilty and the erroneous decisions by the board of general appraisers had made it necessary to apply the remedy of specific duties instead of ad valorem."

LABOR IN ENGLISH FACTORIES.

A child in England may begin working in a factory or above ground at a mine, when 12 years of age, but must attend school regularly half time; at 13 years of age he may begin working full time under certain restrictions. From 14 to 17 years of age, inclusive, he is a young person in the eyes of the law. In textile factories young persons may work from 6 or 7 a. m. to 6 or 7 p. m., but not more than 55½ hours weekly.

The number of children working half time in Great Britain has decreased materially in recent years, and this is said to have been due mainly to restrictive legislation. Employers no longer consider youthful labor the most profitable; the sentiments of parents is changing and working people are better able to get along without the wages of their children. The law places general restrictions upon the employment of children outside of school and gives authority to local governing bodies to increase these restrictions.

Regarding their economic effects the factory laws have been a potent cause in shortening and in making regular the working day of women and children, without interrupting the progressive improvement in wages.

The health and morals of operatives have been helped by improved factory accommodations, better sanitation, separation of the sexes during labor, and the guarding of dangerous machinery and processes. Educational requirements for children have helped to enforce compulsory education and the necessity for certificates of fitness for employment has made parents more solicitous for the health of their children. The industrial employment of women does not appear to affect materially their marriage rate. Among the most important social effects of the employment of married women are a lower standard of family comfort, unwholesome diet, reduction in school attendance of chidren, a lower birth rate, and high infant mortality.

Present conditions in that country are an improvement upon those of the past; but the view is coming to be accepted that the influence of the law must exceed the bounds of the factory. There must be improvement of conditions in the homes of the workers, in the intimate affairs of domestic life, and this can be brought about only by the gradually introducing higher efficiency, higher earnings and a more intelligent distribution of home expenditures. Fundamentaly, therefore, the problem has two aspects—economic and educational.

KNITTING

ANALYZING A CUT BALBRIGGAN UNDERSHIRT.

BY ERNEST TOMPKINS.

It frequently happens that a shirt is brought to the superintendent of a knitting mill with the question: What is the gage of the machine and the count of the yarn? Here follows a simple explanation of how to go about getting the answer to this question. It will be noticed that other information of interest will develop in the process.

THE WEIGHT PER DOZEN.

It is advisable to ascertain this at the outset, as one means of classifying underwear is by the weight per dozen of a standard size—for men's underwear, generally No. 40, which measures forty inches in circumference or twenty inches in width, double. The weight per dozen is, of course, obtained by weighing the garment and multiplying by twelve. This weighing should be made with accurate scales. Yarn scales weighing ten thousandth of a pound are very convenient for this work. Of course, scales weighing in grains or other denominations may be used, but in that case transformation is necessary to reduce the result to pounds, and as both the underwear and the yarn is classified directly or indirectly in pounds a scale reading in decimal fractions of a pound is generally preferable.

THE METHOD OF MAKING THE GARMENT.

This is always a matter of interest and helps to locate the place of manufacture. For instance, a loop collarette is much more common in foreign underwear than in the domestic; a cuff with an open work ornamentation also indicates foreign origin. Other indications are the shape, method of seaming and of finishing. These, however, do not properly come under the head of knitting so they are not discussed here, as the main question relates to knitting.

THE GAGE.

The gage is the number of needles in an inch and a half of the circumference of the needle cylinder. It is safe to say that no absolute means is known of determining the gage of the machine from the garment made on it, but the number of wales per inch in the garment has a relation to the gage of the machine as well as the number of courses per inch, the weight of yarn and the number of stitches per one foot of yarn. Those who have had experience in the manufacture of underwear and have determined the features just mentioned should be able to fix the gage with sufficient accuracy to duplicate the garment commercially. How to fix the gage is explained later.

THE NUMBER OF WALES.

The determination of this is, of course, made by counting the number of vertical ridges per inch, using a scale or a linen glass. It is advisable, however, to count the entire number of wales in the garment. This statement may sound absurd, as counting all of the wales in a fine gage garment seems at first to involve serious labor, but an accurate analysis can not be made without knowing the number of wales very closely, and if the counting is done patiently and systematically the labor involved is not serious. A linen glass may be used. Suppose that the field of the glass includes twelve wales. Count only ten, marking every tenth stitch by revolving in it the point of a sharp pencil. Continue this method, resting at intervals if desired, until the whole circuit of the garment has been completed. Then count the number of spaces between the marks, multiply by ten and add the few stitches that are between the first and the last marks. This gives the number of needles in the cylinder, and divided by the circumference of the garment gives the number of wales per inch.

COURSES.

These may be obtained as were the wales, but the counting of a considerable number is not desirable. The number in three inches divided by three gives the courses per inch with sufficient accuracy.

GETTING THE WEIGHT OF YARN.

With the help of an assistant, hold the garment so that the light will shine through one side. Short streaks will be noticed running around the circumference. These are the heavy or light places in the yarn. Cut off the hem of the garment following these streaks all the way around. If this is done carefully the finishing cut will be very close to the starting point. Similarly cut off the upper portion of the garment just below the bottom of the facing. The upper portion of the garment and the hem should be kept for reference. The real work is to be done on the band of cloth which has been cut out.

RAVELING.

This is the tedious part of the whole analysis. In order to ravel the yarn properly it is necessary to clean out the little pieces of lint left by the shears. If these are not picked out or brushed out they will make raveling difficult. Start at any place on the edge of the cloth and pick this waste clear for a little ways. then with a large pin or other pointed instrument pick up one of the threads between the loops. It will start to ravel in both directions and one of three things will occur: It will ravel entirely free; one end will ravel free and the other end will be bound; or both ends will be bound.

In the first case, start with the next course and ravel that. In the second or third case, start with the course that binds the one which was being raveled, repeating this process until every thread encountered has one end free and the other end bound. The number of exposed ends is the number of feeds used in the manufacture of the garment. In order to get at the count of the yarn it is necessary to ravel all of these threads together. To do this, put the band of cloth over the back of a chair, selecting one that is the proper width to keep the cloth from sliding down too far, and having the exposed ends uppermost. Get as many helpers as there are exposed threads, and let each helper wind a thread on a paper cone, walking around the chair as the yarn is raveled. In a very few minutes sufficient yarn may be raveled in this way to make a reliable weighing. For No. 20 cotton yarn, eighty-four yards is ample. The yarn may then be reeled

from the cones, taking each one in succession until exactly eighty-four yards are reeled. The weight of this divided into .10 gives the count of cotton yarn. For other systems of yarn counts the reeling and weighing may be modified according to generally understood rules for this purpose.

OBTAINING THE STITCH.

The number of stitches per one foot of yarn is an important feature in any analysis of knit cloth, because from this the production of the machine in pounds may be calculated having given the gage, speed, and the count of the yarn. To obtain the number of stitches per one foot of yarn weigh the piece of cloth remaining after raveling, as described above, first raveling the other end once around so that the piece will have the same number of courses throughout. Multiply this weight by the number of feet of yarn in a pound. This may be obtained in yarn tables or calculated from the definition of the yarn count. For instance: For cotton yarn the count is the number of 840 yard pieces in one pound; that is, for No. 20 yarn there are in one pound twenty lengths of 840 yards each; that is, twenty lengths of 2,520 feet each; that is 50,400 feet of yarn in one pound. The piece of cloth that has been weighed will probably be a small fraction of a pound. Multiplying 50,400 by this small fraction will give the number of feet of yarn in the pieces of cloth. Now count the number of wales and courses in the piece of cloth, multiplying these numbers together, thus obtaining the number of stitches. Divide this by the number of feet of yarn in the piece, which gives the number of stitches per one foot of yarn. The average number of stitches per foot of yarn is three times the gage. For instance, for 28 gage the number of stitches is $3 \times 28 = 84$. A tight stitch runs higher and a loose stitch lower, so, having obtained the number of stitches per one foot of yarn, divide by 3 to get an approximate idea of the gage. Note, that this is only approximate and should be be given much weight only in concurrence with other features such as the count of the yarn and the wales per inch.

COUNT OF YARN AS INDICATING GAGE.

It is, of course, generally understood that there are counts appropriate to different gages, but these may vary within a considerable range depending on the length of stitch, the material of which the yarn is composed, etc. For cotton yarn and good average practice the following table may be used as a guide:

Gage	Yarn Cotton No.	Gage	Yarn Cotton No.
10	2.5	24	15
12	3.5	26	17
14	5	28	20
16	6.5	30	22
18	8	32	25
20	10	34	27
22	12	36	30

In general, the shorter and more pliable the fiber the heavier may be the count. Also with two-thread work the combined count may be heavier than with a single thread. Also, the variation in count may be greatest on the fine side. For instance: No. 20 yarn is suitable for 28 gage, yet by tightening the stitch a presentable piece of fabric might be made on that gage with No. 30 yarn or even finer, but ten counts in the other direction would be inoperative. Indeed, even counts coarser would be regarded as impractical. Consequently judgment must be used in approximating the gage from the count of the yarn so that this also should be used in conjunction with the other indication enumerated above.

WALES PER INCH AS INDICATING GAGE.

The common rule is that the gage is the number of wales per inch of the finished cloth. This rule is fairly reliable for the general run of goods of domestic manufacture. It should be understood, however, that two garments cut off of the same piece of cloth, but finished with a different width of drying board, would necessarily have a slightly different number of wales per inch; so this rule is also approximate, although not as much so as the others. Indeed, it is quite dependable with the use of a little judgment considering the material and probable method with which the goods were treated. For instance, wool will shrink more than cotton; a fabric knit with a tight stitch will lay out somewhat wider than one knit with a loose stitch, etc.

NUMBER OF NEEDLES AS INDICATING GAGE.

This is one of the most reliable means of determining the gage, of a shirt especially, if it is not known what diameter of cylinder was used in making it. The number of needles is of course the number of wales in the circumference of the shirt and this divided by the circumference of the cylinder in inches gives the number of needles per inch in the needle line. Increasing this by one-half gives the gage. For instance, if the number of needles per inch is 20, adding half of this, namely 10, gives 30, which was the gage of the machine. Or, if instead of the gage the designation of the fineness were given in the number of needles per inch, as is generally the case with trick needle machines, it would be what is called "20 to the inch." In some sections of New England it is customary to call the gage twice the number of needles per inch, so that a machine having 20 needles to the inch would be called a 40 gage machine. However, this method seems to have no good reason for being, and it is to be hoped that for simplicity's sake it will be discarded. Of course it is desirable to know the diameter of machine on which the cloth was knit in order to determine the gage, but it is supposed that this analysis is being made in a knitting mill, which of necessity contains some knitting machinery. Supose that the number of wales in a No. 40 garment is exactly the number of needles in a 19 inch cylinder in that knitting room; or if not the exact number very close to it. There would be a good reason for believing the cloth in the garment had been manufactured on that diameter of cylinder and, of course, the gage would then be known.

THE DIRECTION OF MOTION OF THE CYLINDER AS INDICATING THE GAGE.

Hold a piece of cloth face to face with the observer and notice the raveled ends at the bottom. If they point to the left the machine revolved in that direction and vice versa; or more accurately, if they pointed to the left the machine revolved clockwise and if to the right the machine revolved anti-clockwise. It is supposed, of course, that the machinery under consideration is that from which the cloth travels upward, but the rule is true of circular machinery in general with the provision that the machine is viewed from the side on which the cloth is, i. e., the top side if the cloth runs upward and the bottom side if it runs downward. Consequently, if it were made on a foreign machine in which the cloth runs downward the observer would be supposed to take the direction standing

on his head, in which case the machine would still run in the direction pointing by the raveled ends or the reverse direction looking down on top of it. In other words, when the cloth runs downward the machine viewed from the top turns in the direction opposite to that pointed by the raveled ends. The following table summarizes the above for the customary direction of motion for the best known types of loop wheel machinery. Bear in mind that the face of the cloth is to be toward the observer and that the bottom raveled ends are referred to:

Raveled ends pointing to left.
Crane, American
Blackburn, English
Mellor, English
Raveled ends pointing to right.
Tomkins, American
Campbell & Clute, American
Terrot, German

ACTUAL ANALYSIS.

No. 40 balbriggan shirt. Width, double, 19.75". *Weight Per Dozen:* Garment weighed .4259 lbs. (Weight garment) × (number in dozens) = (weight per dozen.) .4259 × 12 = 5.12 say 5.

Number of Wales: Actual count 1128. Wales per inch. (Number of wales) ÷ (circumference of shirt) = (wales per inch.) 1128 ÷ (19.75 × 2.) 1128 ÷ 39.50 = 28.5

Courses Per Inch: Actual count of 3 inches 114. 114 ÷ 3 = 38.

Raveling: Five ends of double thread were found. The threads were of the same size. Consequently the garment was knit two thread on a five feed machine.

Yarn Count: *Eighty-four* yards of yarn (two threads) weigh .048. $\frac{.1}{\text{Weight 840 yds}}$ = cotton count. Dividing by 10, $\frac{.10}{\text{Weight 84 yds}}$ = cotton count. $\frac{.10}{.048\ (\text{Wt. 84 yds.})}$ = 208 say 20. Since this was composed of two threads of the same size the single yarn was No. 40.

Stitches per one foot of yarn: A parallel ended band of cloth 14½" across the courses weighed .1294 lbs. Courses across = 14½ × 38 = 551. Wales total, by count 1128. (Courses) × (wales) = (stitches in piece.) 551 × 1128 = 621,528.

Since one pound of No. 20 yarn contains 20 hanks of 840 yards each, and there are three feet in a yard the number of feet of No. 20 yarn in a pound is:
20 × 840 = 16800 × 3 = 50,400.

Since the piece of cloth weighed .1294 lbs. the number of feet in the piece is: 50400 × .1294 = 6521.76. (Stitches in piece) ÷ (feet of yarn in piece) = (stitches per foot) 621,528 ÷ 6521.76 = 95.

Gage of Machine: Assuming that the garment was made on a 20" cylinder, the needles per inch would be the total wales divided by the circumference of the cylinder. Circumference of 20" cylinder is 62.832. (Total wales) ÷ (circumference of cylinder) = (needles per inch) .1128 ÷ 62.832 = 17.95 say 18.

The gage is the number of needles in an inch and a half. (Needles in inch) + (needles in half inch) = gage. 18 + 9 = 27.

Since this is an odd gage the machine is evidently not engaged according to the English standard but by the needles per inch, a method used with thick needle machines, so the cylinder used was probably a 20" diameter 18 needles to the inch.

The raveled ends point to the left so the machine turned in a clockwise direction.

SUMMARY.

Weight of garment 5 pounds to the dozen. Gage 27, or 18 needles to the inch. Machine 20" clockwise. Feeds 5. Yarns 2/20. Stitch 95 needles per one foot of yarn.

GENERAL REMARKS.

The methods used in the above analysis are applicable to an extent to almost every garment knit in a tube and retaining its original tubular form. Of course, if the garment is fashioned either on the machine or if the tube is cut for the purpose of making a fashioned seam the raveling can not be done as described. Many garments may be raveled from only one end. Among these are the following kinds—ribbed, tucked and transferred. Indeed the analyzing of fancy garments requires special treatment, the description of which is too long for an article of general interest, but the principles outlined in the analysis given may be modified to meet the conditions so that with the exercise of a little patience and observation a very satisfactory analysis can generally be made.

RIB TOP MACHINE.

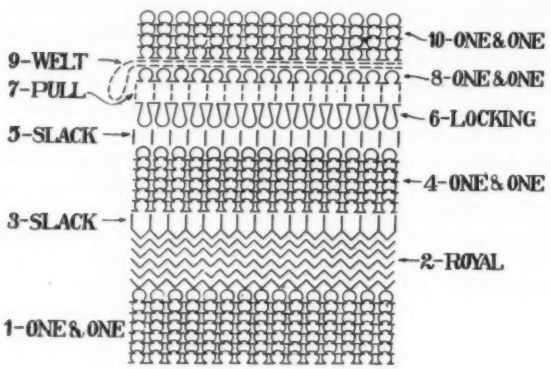
The accompanying diagram of a knitted fabric shows the different stitches used in knitting the sections of a fabric on an improved circular rib knitting machine, known as a "rib top" machine, of the same class as that patented to Hurley in 1898, wherein a string work of fabric was produced, one end of each section of the fabric terminating in a welt which was joined directly to the termination of the adjacent fabric which was of one-and-one rib, the object of the machine being to produce a welt which would serve as a finish to the ends of cuffs, drawer bottoms, bottoms of shirts, tops of socks, and such other purposes as desired.

The improvement has for its object to produce a string work of ribbed fabric including one-and-one, royal tuck and loose courses and to join the one-and-one rib of one end of a section of the fabric to the welt of the succeeding section by one or more courses of plain fabric, so that the section may be separated one from another by cutting without any danger of injuring the one-and-one stitch or the welt, or, if preferred, the sections may be separated by withdrawing one course of the plain fabric joining the sections together. In order to secure this result, the machine is so constructed that after the rib work of different kinds, which constitutes a section of the rib fabric, has been finished, a locking course is knitted on the primary needles; then one or more courses of one-and-one fabric are knit on both sets of needles; then both the old and new loops are cast off of the prinmary needles in a single feed while the secondary loops are held on the secondary needles; the tension of the take-up upon the fabric then causes the loops formed by the primary needles to ravel back to the locking course, leaving between the sections one or more courses as many as may be desired, which can be cut to separate the sections one from the other, or the sections may be separated by removing a single course of the plain fabric, which is obtained by raveling. It may be noted that after the one-and-one has raveled back to the locking course a single course of one-and-one is knit on both sets of needles and subsequently the action of the needles is changed to knit the welt of several plain courses; then continuing with the one-and-one to join the welt to

the previous one-and-one, and then continuing with both sets of needles to knit another section of rib work.

Another object of this invention is to so arrange and operate the shipping pins that the loose course will be knit entirely around the fabric.

In the present machine there has been combined with the stitch forming mechanism a sinker wheel having movable blades which are automatically operated to feed different lengths of loop between the needles.



The machine is arranged and constructed to knit the sections of fabric as follows: 1st, a one-and-one fabric; 2d, royal or tuck; 3d, a slack course; 4th, one-and-one; 5th, a slack course; 6th, a locking course; 7th, a single course of one-and-one, the loops of this one-and-one course being pressed off the primary needles and allowed to ravel back to the sixth or locking course. Any number of these one-and-one courses can be knit upon the machine and allowed to ravel back to the locking course by increasing the number of feeds. 8th, a single course of one-and-one; 9th, the action of the needles is changed to knit the welt of several plain courses; 10th, a one-and-one course joining the welt to the previous one-and-one course and continuing in the same order.

The different sections of fabric, after being separated one from the other, are used in cuffs, drawer bottoms, bottoms of shirts, tops of socks and the like.

The improvement consists in certain mechanism inserted between two feeds, whereby the new loops are cast off the primary needles before the yarn for another loop is fed thereto—that is, the primary needles are pressed twice between two successive yarn feeding devices, so that the old loops and the new loops are cast off of the primary needles, and the loops drawn by the primary needles in the knitting of the one-and-one or regular fabric are thus allowed to ravel back to a locking course previously knit, the secondary loops being held upon the secondary needles, the resultant fabric being at this particular point the same as though a plain course or several plain courses were knit upon the secondary needles with the loops extending toward the finished face of the fabric.

Fifty-two per cent. of the textile manufacturers of North Carolina pay wages weekly; 41 per cent. pay semi-monthly; 5 per cent. pay monthly. and 2 per cent. on demand.

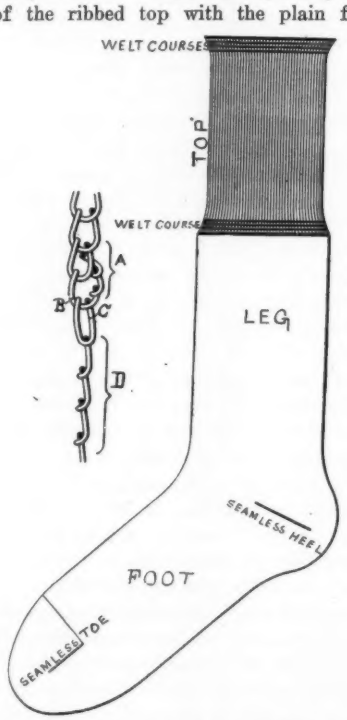
Besides the use of chrome as a mordant on wool before dyeing, it forms very valuable developing or fastening baths when used on the top of the dye.

TO PREVENT EXCESSIVE STRETCHING.

We show herewith a hose having a leg of plain knitted web and a top of ribbed knitted web, with features, the object of which being to prevent excessive stretching of the ribbed web and consequent eventual loss or serious impairment of its elasticity. The illustrations show a knitted sock and an exaggerated sectional view of the stitches in that portion of the sock where the plain leg joins the ribbed top.

It is common to provide many forms of full hose or half hose having legs and feet of plain knitted web with tops composed of ribbed web, in order that the top portions of the hose may be of a more elastic and contractible character than the web constituting the leg and foot. After the hose has been in use sometime, however, these ribbed webs, because of repeated stretching, lose either all or the greater portion of their elasticity. It is also customary to provide the upper end of a ribbed top with one or more of what are termed "welt courses" in order to prevent the web from raveling. It has been found that if one or more similar welt courses are formed in the ribbed top just above the junction of the same with the plain web leg, the undue stretching of the ribbed web will be prevented, and the ribbed top will preserve its elasticity for a much longer time than in the absence of such preventive means.

The top is composed of ribbed tubular web having, at its upper end, a series of welt courses, and just above the junction of the ribbed top with the plain foot another



series of welt courses. These so-called welt courses are produced by arresting the knitting operation upon one of the sets of needles with which the rib knitting is provided, continuing to knit one or more courses of stitches upon the other set of needles of the machine, and then resuming the knitting of the ribbed web. The ribbed tops are usually knitted in succession in long webs, and adjacent to each welt course or series of welt courses, there is what

is termed a "slack course" produced by drawing longer stitches in the course than in the others, this slack course being the one which is transferred to the needles of the plain machine upon which the leg and foot of the stocking are knitted, and the lengthening of the stitches in the slack course being intended for the purpose of facilitating such transfer. The ribbed web is served at points between the slack and welt courses so that in each ribbed top thus produced, the welt courses are at the upper end and the slack course at the lower end.

A represents the stitches produced upon one set of the needles of the rib machine, while the stitch B is being held upon the needles of the other set. C represents the long or slack course, and the plain courses produced upon the needles of the machine to which the long or slack course of the ribbed web has been transferred.

YARN CHANGER.

The mechanism shown herewith relates to a yarn changing device especially applicable to spring needle knitting machines. Its object is the production of a comparatively simple and efficiently operating device for automatically changing the kind or color of yarn being fed to the machine to yarn of a different kind or color without interfering with the operation of the knitting machine.

Figure 1 is a front elevation of a yarn changer. Fig. 2 is an end elevation.

In the operation of the invention, one of the yarn-changing members being in operative or knitting position, the adjacent yarn cutter will be held in an inoperative position, as shown. As the operating lever is pressed downward by the roller A being engaged by the cam on the cylinder of

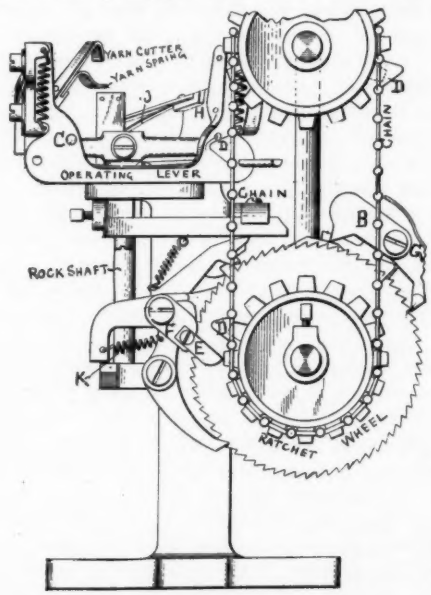


FIG. 1.

the knitting machine, a rocker member is rocked or moved inwardly by the rock shaft. As the rocker member is near the end of its forward stroke or movement, the dog B engages the ratchet wheel and turns it one notch. The rocker member is then caused to return to its initial position by a spring C connected at one end with a finger extending inwardly from the rocker member and at its opposite end with the body portion of the supporting frame. As the operating lever is oscillated a step-by-step movement is imparted to the ratchet wheel until the engaging portion D of of the chain strikes the engaging finger or portion E of the operating lever F and causes a depression of the free end of the regulating member.

After the free end of the regulating member has been depressed, the dog G engages the setting wheel and as the rocker member returns to its initial position moves the setting wheel one notch and reverses the relative position of

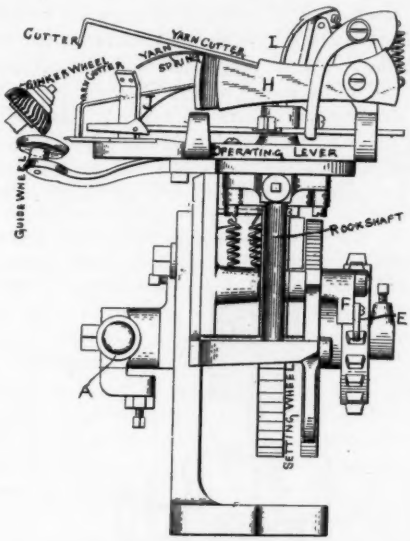


FIG. 2.

the free ends of the push or operating bars; that is, lowers the one that was in elevated position in the path of the head or engaging portion of the rocker member and elevates the other. As the rocker member is now rocked forwardly its head or engaging portion engages the free end of the push or operating bar now disposed in its path, and through the medium of the vertically disposed rock shaft, moves the lifting arms in opposite directions. As the arms are moved, one engages the inclined edge of one of the lifting members H and raises the yarn cutter that was in lowered or yarn-cutting position to elevated or inoperative position, and carries the adjacent yarn-changing member to its operative or knitting position; and at the same time the other arm moves the other yarn-changing member to its inoperative position and trips the adjacent locking lever I when the adjacent yarn cutter is released and cuts the yarn, its spring J bearing upon the yarn feeder of the yarn changing member in inoperative position and thereby causing the yarn feeder to hold the cut end of the yarn. During this operation, the dog B turns the ratchet wheel a sufficient number of notches to disengage the engaging portion or member D of the chain with the engaging finger or portion E of the operating member F when the regulating member is returned to its normal position by the spring K.

A good snow white is almost always wanted on mercerized lawns; 2 gills of ultramarine blue, and 2 gills of the mid or prussian blue form 1 pound standard mixing. The judgment of the finisher, of course, is always required to give a blue to suit the variations of qualities and of bleaching.

STOP MECHANISM FOR REINFORCING YARN.

We show herewith a mechanism applicable to a circular knitting machine in which an extra cop or the like is used to carry a yarn for reinforcing the article produced, as where double knees are made in stockings or the like. Means are provided for operating a belt device in case the reinforcing yarn breaks or is not threaded into the machine as required.

Figure 1 represents in rear elevation, so much of a knitting machine as is necesary to show the device. Fig. 2 represents parts of the device detached from the knitting machine. Fig. 3 represents the yarn engaging portions of the device shown in Fig. 2 in another position.

For clearness of illustration many of the well known working parts of the knitting machine are omitted from the drawings, including the needles and the cops ordinarily used in producing the stocking or other article to be made.

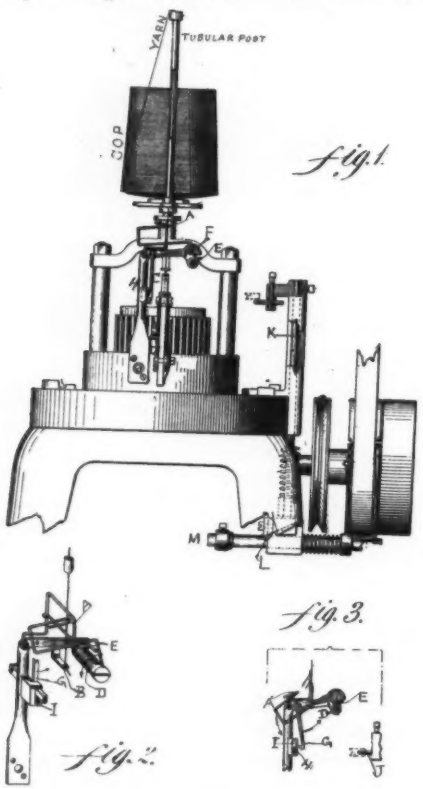


fig. 1.

fig. 2.

fig. 3.

The cop is composed of the yarn intended to be knitted in at the knee or other point of a stocking or like article where reinforcing is required. When in operation, the yarn is led from the cop through a guide and through a tubular post, thence through a hook A and an eye, thence it passes through a guide or eye C, on a lever and through a yarn carrier (not shown) to the needles. It is obvious that if the yarn parts, the hook A, will no longer be supported thereby and that the coil D will turn in the direction of the arrow, Fig. 2. The movement of the lug E will raise the weighted end of the lever F thereby disengaging the hook thereon from beneath the bar H, permitting the bar to drop to the bottom of the slot I. The bar when released by the hook drops into the path of a pin J and thereby acts to give a rod K a partial rotation. A cam at the foot of the rod then acts through a lever to release a latch mechanism. A latch L coacts with a slot which latter is located on the rod M which is released so that by the force of a spring the belt is shifted to the loose pulley thereby stopping the machine.

VALUATION OF PROPERTY FOR INSURANCE AND ADJUSTMENT OF FIRE LOSSES.

The standard insurance policy adopted by most of the States contains these words; "This company shall not be liable beyond the actual cash value of the property at the time any loss or damage occurs, and the loss or damage shall be obtained or estimated according to such actual cash value, with proper deduction for depreciation, however caused, and shall in no event exceed what it would cost the insurer to repair or replace the same with material of like kind and quality."

Its theory is that if any loss occurs, the insurance paid shall be sufficient to replace the portion lost, in exactly the same manner as it was before, less a fair amount for the depreciation of the property from age. No depreciation, however, is allowed for items that reduce the value, as lack of light, inconvenience of arrangement, character of the construction, the fact that a machine may not be economical in its working, or that the steam plant may be an economical one, although such consideration is contemplated in the first portion of the statement quoted. For this reason it is sometimes the case that, if a concern is completely wiped out of existence, after the effect of the first blow is over and the property is rebuilt on new lines, it is vastly better off than before the loss.

The story is told of a man who was sent a few years ago to make an examination of a mill in order to see if anything could be done to make its running more successful by reorganization. His examination was brief and his report still briefer; it was to the effect that the only thing which could do any good was a first-class fire. This mill was afterwards sold in open market. Its selling price was very much less than it was taxed or insured for.

The adjustment of fire loss is usually made upon the basis above stated, and that the sum paid shall be sufficient to replace new the burned or injured property in the same manner as it existed previous to the fire, less a fair depreciation for age. As it is almost impossible, even by a very careful examination, to consider every item of loss, and as the owner is subjected to many losses which are not covered by the insurance, it is the policy of many of the factory insurance companies to be liberal in their settlements, although they state that nothing will be paid for unless in an inventory to which the assured will make oath as true to the best of his knowledge and belief.

These losses are almost always adjusted amicably and without recourse to law. Some times they are determined between the adjusters of the insurance companies and the owner or manager, and some times the insurance companies appoint an adjuster and the mill another adjuster, and these two determine the loss; and if they can not agree on any item they call in a third party, and decision of any two of the three is final. These adjusters should be men who are familiar with the value of the property destroyed, and more than one set may be required to cover the various kinds of property. Perhaps one set for buildings, one for machinery, and one for goods and stock. The findings of these adjusters are final and conclusive.—*Charles T. Main.*

DYEING, BLEACHING AND FINISHING

CHEMICALS USED IN THE TEXTILE INDUSTRY.

BY FREDERIC DANNETH, PH. D.

Lecture at the Kensington Institute of Philadelphia.

(*Reported Exclusively for COTTON.*)

PART I, CONSISTING OF LECTURES ONE AND TWO, CONCLUDED.

Now that we have become acquainted with the methods of analysis we will turn our attention to the practical purification of the water. Scaife has defined the following points as essential for a water softening plant: (1) accurate chemical treatment; (2) thorough mixture of reagents with water; (3) accelerated chemical action; (4) complete chemical reaction; (5) rapid sedimentation; (6) perfect clarification.

The first point is determined by occasional analysis; the second is attained by means of mechanical stirring devices; the third is obtained by mixing the sludge of previous operations with the newly treated water; the fourth is accomplished by using an apparatus of the necessary size and allowing the proper time for settling; sedimentation is hastened by mixing old sludge with the water; clarification is effected by means of mechanical filters.

The temporary hardness of water may be removed by lime as follows: Calcium bicarbonate + lime = calcium carbonate + calcium carbonate.

Any magnesium carbonate which is dissolved in the water is removed as follows: magnesium carbonate + calcium hydroxide = magnesium hydroxide + calcium carbonate.

Any magnesium chloride present in the water is removed as follows: magnesium chloride + calcium hydroxide = magnesium hydroxide + calcium chloride.

Permanent hardness is removed by the addition of soda ash (commercial carbonate of soda) as follows: calcium sulphate + soda ash = calcium carbonate + sodium sulphate.

If sulphuric acid be present in the water it may be removed as follows: sulphuric acid + barium carbonate = barium sulphate + water + carbon dioxide.

The method in general use at the present day was patented in 1841 by Thomas Clark of Aberdeen, Scotland, and later improved with the assistance of Porter, and is named after them the Porter-Clark process.

A weighed quantity of lime is carefully slaked with water and added to the water tank in the quantities indicated by the water analysis. As this removes only the temporary hardness it is supplemented with a treatment with soda ash. As before stated. this substance converts the soluble calcium sulphate into insoluble calcium carbonate. It has been found that the best results are obtained when the water is allowed to settle for some time after the treatment.

Lecture III.

SOAPS FOR TEXTILE PURPOSES.

Principle of soap manufacture: When certain oils or fats are boiled with concentrated solution of sodium or potassium hydroxide, the fat decomposes. Glycerin (glycerol) is set free and the metal (sodium or potassium) combines with the remaining fatty acid to form a soap (e. g. sodium stearate). The chemical change which takes place is called saponification. Other mediums used for splitting up the fat are steam, lime and sulphuric acid.

The raw materials used in soap manufacture include—(1) tallow obtained from oxen and mutton, lard obtained from swine, fat obtained from horses and many sea animals, suet obtained from the kidneys of sheep and cattle; (2) vegetable oils such as cotton, olive, palm, cocoanut, corn, and hemp oil; (3) mineral products obtained from petroleum and the rosin obtained from turpentine distillation.

With the exception of the third group, these substances represent the organic constituent which is needed to combine with the alkali in order to form a true soap. As the soap must be soluble in water, if it is to be used as a detergent, there are but two alkalies which can be used, namely caustic soda and caustic potash. If we should prepare soaps from the several fats named above we would find that each combination possessed different properties. Thus tallow saponified with caustic soda (sodium hydroxid) would produce a "hard soap," while caustic potash (potassium hydroxide) would yield with tallow a "soft soap." These terms indicate the consistency of the product and incidently we may note that all soaps made with caustic soda will be hard and all soaps made with caustic potash will be soft. If palm oil, or rather palm fat—for this material is not at all liquid—be saponified with caustic soda we will obtain a soap which can be used in water containing cook-salt, e. g., ocean water.

On the contrary a soda tallow will produce no foam with salt water because it is insoluable in this medium. Cocoanut oil-soda soap and palm oil-soda soap are, however, quite soluble in brine, and are therefore of great value for use on ocean steamships. Filled soaps (hydrated soap) are those from which the glycerol has not been removed by any process of "salting out." Fig soap is usually made of potash and olive oil, the "figged" appearance being due to the crystaline potassium stearate which forms the greater portion of the soap. Curd soap is a true hard soap prepared from caustic soda and melted fat; the soap is salted out with brine and therefore does not contain any glycerol.

THE IMPURITIES.

The impurities which may be encountered in the soaps of commerce include a large variety of substances from the animal, vegetable and mineral kingdom. True the tallow may have been of a low grade, admixed with membranes, etc., or fish oils may have been used as the fatty constituent. The latter material is objectionable because of its bad odor. Dextrine, flour and colophony (rosin) are at times added in order to give "body" to a soap containing an

unnatural amount of water. They also serve the purpose of cheapening the product as they are worth from two to four cents per pound while good soap is worth from five to seven cents. The mineral substances (inorganic matter) added to give weight to the soap rather than to increase its detergent power include, common sand (silica), water glass (sodium silicate), chalk (calcium carbonate), heavy spar (barium sulphate), glauber salt (sodium sulphate), clay (mostly aluminium oxide), fuller's earth, pumice stone.

The cleansing power of a pure soap depends on the fact that it readily undergoes "hydrolysis" when dissolved in water. This will be better understood when I say that a small amount of free alkali is formed whenever soap is dissolved in water. If a large quantity of water is used, the amount of free alkali in the water will increase but the concentration of the alkali will not rise, because the volume of the water has also been increased. The use of soap possesses, therefore, the special advantage that the amount of free alkali never rises above a certain concentration. Hydrolysis solution by water is the term term applied to the chemical change which takes place when compounds of strong acids and weak bases (aluminium sulphate) or compounds of weak acids and strong bases (sodium carbonate) or compounds of weak acids and weak bases (aluminium acetate) are dissolved in water. As a result of this the solution of aluminium sulphate shows an acid reaction and the solution of sodium carbonate shows an alkaline reaction.

Soap is composed of a strong alkali (e. g. caustic soda) and a weak acid (e. g. stearic or palmitic), and the detergent power of the aqueous solution of soap is due primarily to the caustic soda which is "split off," and which is then capable of emulsifying and dissolving fats and greases. The foam during the agitation of the liquid assists in removing the dirt after it is loosened. Soaps from which the glycerin has not been removed during manufacture are very desirable for toilet use as this constituent acts as a lubricant and counteracts the harshening effect of the alkali. The transparent toilet soaps frequently sold under the name of "glycerin soaps" are generally made by evaporating an alcoholic solution of soap and hence do not contain any glycerin whatever.

Before proceeding to study the uses of soap it will be well to review briefly the chemical principals involved in its manufacture. Stearin is a typical fat, its chemical name is glyceryl stearate. Glycerin is antriatomic alcohol (glyceryl hydroxid or glycerol). Caustic soda is a caustic alkali (sodium hydroxid). Soap is a chemical compound (sodium stearate). Glyceryl stearate+sodium hydroxid=sodium stearate+glyceryl hydroxid. It is interesting to note that this is the only commercial source of glycerin at present known.

SPECIAL SOAPS.

Soaps for waterproofing. These preparations are as the name indicates intended primarily for raincloths and similar fabrics. Such soaps must needs be insoluble in water so that those prepared from soda and potash do not enter into consideration. On the other hand those containing earths and alkaline earths are of chief importance. Waterproof soaps are in nearly all instances produced direct on the fabric as illustrated in the folowing procedure:

The goods are impregnated on the jigger with a solution of aluminium acetate of nine degrees Twaddell, squeezed, and then passed into a bath containing five pounds of ordinary soap in three gallons of water, or six pounds of rosin soap in five gallons of water. If it is desired to produce a zinc soap on the fabric, a bath is prepared with one pound of zinc sulphate in two gallons of water. The second bath is prepared by dissolving 20 pounds of dextrin in 10 gallons of water to which is added a solution of 10 pounds of palm soap and 10 pounds of potash in 10 gallons of water. Another method for preparing zinc soap consists in dissolving 60 pounds of soft soap in 20 gallons of water and adding 30 pounds of zinc sulphate. After the whole has been heated to boiling the zinc soap may be skimmed off. Magnesium soap (magnesium oleate) was recommended by Richter of Karlsruhe as early as 1893 as a fire preventive in the cleansing of garments with benzine. For this purpose the soap is merely dissolved in the benzine or gasoline. Lead soaps are of little industrial importance, they may be prepared from soft soap and lead acetate.

The "bast soap" used in the silk dyehouse is not a commercial article. It is a side-product obtained by boiling off the coating of gum or sericin from raw silk. For this purpose a bath is prepared by dissolving one pound of high grade olive oil—soda soap in ten gallons of water. The quality of the bast soap solution will depend on the nature of the silk which has been boiled off, and also on the number of lots of silk which have been boiled off in it. Bast soap is used in the subsequent dyeing operations as it assists materially in the production of even shades. I wish to add that unusually good results have been obtained in dyeing chrome mordanted silk with alizarins by using rancid solutions of bast soap.

The "rosin soap" used in the boiling out of cotton is prepared directly in the bleach house by heating rosin (colophony) with concentrated solutions of soda ash or of caustic soda until a clear solution is obtained. The solid "yellow soap" of commerce is frequently adulterated with large quantities of rosin. When purchasing rosin soaps under their true name in the open market any samples containing more than 20 per cent. rosin should be rejected as "undesirable."

Monopol soap is a comparatively recent preparation obtained by double sulphonation of castor oil. It is a modern product resembling true soap only in appearance and a discussion of it will therefore be reserved for the final lecture. Having discussed the several soaps according to their properties we will now turn to the consideration of the processes in which this substance is used.

SOAPS FOR COTTON.

In the boiling-off of cotton, use is sometimes made of the rosin soap just mentioned. This depends upon the fact that the colophony carries the dirt along mechanically and acts to a certain extent on the waxy matter of the cotton fiber. By its use the major portion of the impurities is removed, and the goods can be dyed with madder (alizarin) without danger of dyespots. The rosin boil must be followed by a bath of soda in order to remove the last traces of rosin.

In the bleaching process the goods are finally given a "soft feel" by soaping. As has been mentioned, the water used here must be free from lime as otherwise the feel will not be improved. The soap should not contain any

free fat as this will remain in the goods, turn rancid and in the course of time tender the fabric.

In the washing of calico prints, soap is used for brightening the colors. Such soap must be free from any substances which might have a deleterious action on the dyestuff. The best method of testing the soap in this particular is to make a small preliminary trial. It should be free from uncombined alkali, coloring matter and loading materials.

In the dyeing of anilin black and sulphur colors, the goods acquire a harsh feel which can be remedied by the use of a so-called "softener." These are essentially mixtures of soap with a suitable fat, but soap alone will in many instances produce the desired effect.

In the "brightening" of Turkey reds, the yarn is worked in a soap bath. Here again care must be taken that the water be soft, as hard water will precipitate lime soaps which in turn are deposited on the fiber. The result is a distinct "bloom," and a dull cast on the red.

SOAPS FOR WOOL.

Degreasing. For the removal of the fat from raw wool a soap is required which will readily emulsify the grease, for the washing of raw wool does not depend on saponification as was at one time supposed. Both hard soaps and soft soaps have at various times been recommended, the former because of their low price and the latter because of the glycerin which is always contained in potash soaps. The latter class of soaps, however, contain more or less free alkali which must also be taken into consideration when using them. One sample recently analyzed contained 44 per cent. water and 9.4 per cent. potassic oxid. The fatty constituent was found to be a fish oil. Just whether or not a hard (soda) soap is more suitable than soft (potash) soap is a question which must be decided by the quality of the stock which is being degreased.

Scouring. The object of scouring yarns and fabrics is to remove the oil which has been mixed with the stock for the spinning process. If commercial oleic acid has been used for this purpose the grease can be much more readily removed than in those cases where the wool oil contains large quantities of mineral oil or other unsaponifiable matter. Fabrics may contain more or less dirt and iron if the machinery has been carelessly lubricated. In this case the iron should be removed before the goods come in contact with alkalis, for the reddish precipitate of iron oxide is extremely difficult to remove. Scouring soaps made from bone tallow, or those containing perfumes such as oil of mirbane, are generally classed as "undesirable."

Fulling. The object of fulling is to shrink the goods both in length and in width, thereby giving them "body" or fullness. Palm and tallow soaps are very desirable for this purpose but care must be taken in any case to properly remove the soap by washing with hot water after the fulling operation. There are two special tests which should be carried out with fulling soaps, known as the "spinning test" and the "setting test." For the setting test three large beakers are filled each with 250 grams of boiling water. In the first beaker dissolve 50 grams of soap, in the second, 75 grams, and in the third, 100 grams. A thermometer is now suspended in each beaker and the temperature observed at which each solution "sets." If, for example, the third solution sets or jells at 50 degrees C. we have learned that if our fulling liquid contains 100 grams of soap in 250 grams of water (100 pounds soap in 250 pounds, or 30 gallons of water) the temperature of the rinse water must be at least 50 degrees C. (120°F). If the mistake be made of rinsing the goods with cold water the soap will gelatinize and will then be very difficult to remove.

The spinning test is carried out by dissolving 10 grams of soap in 100 grams of boiling distilled water. The beaker is then placed in a basin of cold water, stirred with a thermometer and the temperature observed at which the solution will draw out into threads. The spinning temperature depends, according to Morowski, on the fusior points of the fatty acids of the soap. It decreases more rapidly than does the melting point of the mixed fatty acids.

A tallow-soda soap spun at 43°C., the fatty acids thereof melted at 43.5°C. A Marseilles soap spun at 4°C., the fatty acids thereof melted at 26°C. A Marseilles soap spun at 25°C., the fatty acids thereof melted at 35°C.

Of these three soaps the one with the spinning temperature of 4°C. was totally unsuited for milling purposes as it would not "stand" in the bath. A good fulling soap should possess a heavy ropy consistency and maintain its "body" for an almost indefinite time. It should possess the property of discharging freely as far as this is possible for a heavy-bodied soap. For the fulling of heavy overcoatings, wool felt hats and the like, a ropy, heavy bodied soap is desired. It should be neutral and unadulterated and may be made of soda and prime tallow. Other types of soap suitable for this purpose are soda-tallow-curd soaps and the mixed soaps such as tallow-palm oil-soda soaps all of which discharge easily and possess a good body.

Authorities generally agree that the use of potash soaps and carbonate of potash leaves the wool in a lofty silky state, and in the best possible condition for carding and spinning. Some observers claim that soda renders the stock harsh and gives it an objectionable yellow tinge. We must, however, note in this connection that well manufactured products, whether soda or potash, will improve or ruin the stock, the results depending upon the skill of the operator. In view of this fact, which by the way is a matter of actual experience, we should not be too quick in condemning one or the other of these two classes of preparations.

From a Southern Bleacher and Finisher.

STRETCH DEPENDS MUCH ON THE WEAVE, PICKS AND TWIST OF YARN. REMNANTS THE PROPERTY OF THE FINISHER. GOODS ARE NOT ALWAYS INVOICED CORRECTLY.

BY HENRY ROWE.

All cotton fabrics will stretch more or less in length while undergoing the process of bleaching and finishing, but will lose in width. The amount of stretch that can be got from a piece or lot of goods before it has gone through the above processes is hard to tell, as much depends on the weave, number of picks per inch, number and twist of yarns, etc.

Two lots of goods from two different mills will show different results, as to amount of stretch, although both lots may apparently be alike in every respect. Then again, two different bleacheries may each have a lot of

goods from the same mill, and these goods may be exactly the same in every respect, but after they are finished one bleachery will probably show a larger percentage of gain than the other; but if the finished goods are examined they will, no doubt, be found to differ in the finish and width. While one finisher may have tried to please his customer by giving him the finish he desires and even width, the other finisher may have tried to show a large percentage of gain, resulting in an inferior finish and uneven width.

Different weaves and fabrics require different methods of handling in bleaching and finishing. Some require more tension than others while passing through the different machines, according to the result desired. More tension than necessary is sometimes used, while oftentimes there is not enough. Hence, there is a difference of gain.

There is always some remnants made in the finishing of cotton goods. These remnants are always supposed to be the property of the bleacher and finisher, which I think is right and proper, but some plants make more than others, some times through the carelessness of their employees, and some through the crude way of handling their work, or in the use of worn-out machinery and poorly laid-out plants. Hence, more remnants for the finisher, less gain for the manufacturer or converter.

But bear in mind, the bleacher and finisher should not always be blamed if he can not get the same percentage of gain for all of his customers on a certain line of goods. If the finisher will go to the expense and trouble to investigate for himself he will oftentimes find goods that are invoiced to him as 38 inches wide will measure only 37 to 37½ inches, and goods invoiced as 37 inches measuring only 36 to 36½ inches. Hence his shortage of gain when he is expected to finish the goods 36 inches.

I know of an instance of a converter sending goods to a certain bleachery from two different mills, invoiced as 37 inches. They were dyed and finished without bleaching, and were to be delivered 36 inches wide. The goods from one mill showed a gain of 2½ to 3 per cent., while those from the other mill showed but little over 1 per cent. These goods were supposed to be exactly the same in every respect, and the converter wanted the bleachery to pay for the loss of gain. This was objected to, and the officers of the bleachery began to make an investigation. By measuring the gray goods they found those from the mill which made from 2½ to 3 per cent. gain, measured fully 37 inches wide, and every lap of the piece 36 inches; while the goods from the mill which showed only a gain of 1 per cent. were from 36 to 36½ inches wide and 35½ to 36 inches in the lap or fold. So it may be realized that it is impossible to lay down any rule whereby a bleachery can guarantee to any of its customers a certain gain on any kind of goods and do it regularly.

There are certain grades of cotton goods that are finished in the gray which will gain from 2½ to 3 per cent.; and other kinds of goods which will gain from 3 to 6 per cent. Then there are certain fine fabrics that must be handled very carefully, which will show only ½ to 1 per cent. gain. When one comes to the low grades of goods that are back filled, the converter or manufacturer is lucky if he gets back even the gray yards.

Inquiries about anything pertaining to the textile industries will be cheerfully answered by COTTON.

DYEING WITH SULPHURIZED DYESTUFFS.

It has been found that it is not essential to avoid the use of alkali sulphide in the dye-bath in order to obviate the majority of the drawbacks in dyeing with sulphurized dyestuffs, provided a bisulphite be present in the bath.

Thus by adopting this expedient animal fibers may be dyed with sulphurized dyestuffs without injury to the material which has been caused hitherto by the usual alkaline sulphide dye-baths. The new process offers similar advantage in dyeing vegetable fibers.

The scheme here presented consists in the practical application of the observation that a dye-bath prepared in the usual manner with a sulphurized dyestuff, sodium sulphide and common salt, may be treated with a large quantity of bisulphite without any of the dyestuff being precipitated. The addition neutralizes the injurious influence of the sulphide of the alkali metal to such an extent that excellent dyeings can be obtained without detrimentally affecting the fiber. By this method of working the condition of the dye-bath may be compared with that of an indigo vat, only the injurious action of the alkali or alkali sulphide may be neutralized to such a point that wool can be dyed at a comparatively high-temperature without danger to the fiber.

The dye-baths do not become exhausted, the operation being similar to that of vat dyeing. The baths may be prepared somewhat stronger than usual and in further working up, the requisite condition of the dye-bath is attained by removing the dyestuffs absorbed by the goods, and by adding an alkali sulphide and bisulphite.

The success of the dyeing process depends upon the adequate proportion of bisulphite being added so as to neutralize the action of the sodium sulphide. However, too great an excess of bisulphite must be avoided, as it unfavorably influences the dyeing. In most cases a suitable proportion of bisulphite has been added when a test portion of the dye-bath does not turn red when a solution of phenolphthalein is added.

The best temperature of the bath in dyeing wool is generally between 70-80° C., which may be raised, however, for deep colors and lowered for light colors. Vegetable fibers are best dyed at a low temperature. By an immersion of only 1-3 minutes in concentrated baths deep dyes are obtained at higher temperature on wool and silk or half wool and half silk and at lower temperature on vegetable fibers thus permitting a continuous dyeing.

The process is also suited for dyeing silk, half-silk, leather, furs, and paper, materials which could not hitherto be dyed with sulphurized dyestuffs owing to the injurous influence of the alkali-sulphide baths. Good results may be obtained with sodium, potassium or ammonium bisulphite. Instead of bisulphites, sulphites may be used in presence of suitable acids or acid salts. If desired, the dyeings may be treated subsequently with metallic salts.

An important result of this method is that wool and vegetable fibers may be dyed simultaneously and the temperature of the dye bath may be adjusted so that the dyestuff is taken up more by the vegetable or more by the wool fiber; the higher the temperature the more the wool is dyed.

The process is also suited for dyeing silk, half-silk, stuffs, good results having been obtained, for instance, with thiogen black, sulphur black, immedial black, thiogen blue, thiogen green, immedial indone, katigen blue, katigen brown, katigen violet, thiogen dark red, immedial bordeaux, thiogen yellow and others. The fastness o fthe dyeings is very good.

MARKET REVIEWS.

THE COTTON MARKET.

BY H. & B. BEER, NEW ORLEANS.

Higher levels for raw cotton, yarn and in some instances for cotton goods are the result of continued unfavorable crop accounts from Texas, due to insufficient rainfall the past six months. Latest advices from Texas are to the effect that the crop is from two to four weeks late in all sections, stands generally poor, prospects being unfavorable for a full yield. There were beneficial rains in favored sections of the State during the first and second weeks in May, but the precipitation, except in scattered localities, was not heavy, and while the crop has been benefited to some extent, the outlook at this moment is not at all satisfactory.

The character of the weather thus far in May generally fair, which proved injurious to the crop in Texas, was favorable for the plant in the Mississippi Valley and South Atlantic States, permitting the completion of planting and making possible rapid execution of field work in the way of cleaning up the fields of grass and cultivating the plant.

All States outside of Texas, however, are limited to a maximum yield of about 10,000,000 bales on basis of the present acreage, which is about the same as last year, perhaps a little less, and as the consuming capacity of the world is gradually increasing, is behooves Texas to furnish a crop of about 4,000,000 bales to meet current requirement, or, say, a total crop of about 13,500,000 bales, as States other than Texas are apt to fall below the ten million mark.

While it is too early to make an estimate on the Texas crop, experienced observers after making their first inspection of the season, are of the opinion that Texas can hardly make 3,500,000 bales, and might easily drop to about 3,000,000 bales, compared with last year's production of about 3,750,000 bales, with 2,221,000 year before last, and 4,050,000 in 1906. If Texas were to make only 3,000,000 bales it would mean a loss for the belt, even though the remainder of the cotton States were to make a full crop, and they may fare badly before the close of the season by a possible summer drouth, or an early frost, to the extent of about 500,000 bales. No offset to these prospects can be expected to had from the acreage, as the total for the South will be about the same as that of last year, a little more or less.

Of late, the weevils have appeared in sections of southwest Texas and Louisana, and as crops are late, especially in the Southwest, much apprehension is entertained lest they do considerable damage.

Present indications, taking everything into consideration are against a bumper crop, while a moderate yield of about 13,000,000 to 13,500,000 bales is by no means assured. Of course, such indications are about discounted by the further advance in futures to about 11 cents for summer positions, to about 10 3-4 for new crop arrivals and to 10 5-8 for middling in this market, but there is no telling what the future has in store in the way of weather conditions for the balance of the year, as in years gone by the most glowing prospects have been blighted by a prolonged spell of excessive heat; the result of a July-August drouth. Such an occurence would make a moderate, much less a large, crop impossible in Texas this year, as there is no moisture in the ground worthy of mention to nourish the plant in event of a summer drouth. It is to be hoped that such a development will not take place, but if it should, present prices will probably appear cheap, even though they be two cents higher than at the time we advised spinners to continue to buy cotton in preference to taking chances on uncertain weather and crop accounts.

It looks as though the present season will be one of high prices, for cotton goods as well as for raw cotton, and spinners will probably do well by refraining from making large contracts for future delivery of cloth around present prices. There has been a better demand of late for yarns at advancing prices, not only in America, but also in England, prices at Manchester having advanced 1-4 the past week. The continent of Europe is reported to be doing a good business, especially France, which country will import upwards of 1,100,000 bales of American cotton this season, or nearly 200,000 bales more than ever before.

It is said that arrangements have already been made to ship a very large quantity of American cotton to Japan next season, report having it that freight room for 1,000,000 bales has been secured, which rumor, however, is probably exaggerated. Nevertheless, the Orient will probably be a very large buyer of American cotton, next season, and may take over 500,000 bales of American cotton, or perhaps 200,000 bales more than ever before. The American mills have done well to have bought so largely at low prices this season, the North having purchased about 1,500,000 bales below nine cents for middling, and are better off to the tune of nearly $10 per bale, and have taken thus far this year 2,425,000 bales compared with 1,523,000 to corresponding date one year ago and 2,356,000 to even date in 1907. Southern mills have bought freely also, and are now reported well engaged on contracts, especially for shipment to China next fall.

THE KNIT GOODS MARKET.

While the demand has not been active for knit fabrics during the past month there has been signs of improvement, and manufacturers and dealers are feeling much more encouraged as a result, the strength being due very largely in the cotton manufactures to the advance in the price of the raw material, which seems to be a substantial one, and likely to have its influence upon the values of goods which many buyers are beginning to realize will not recede to a lower basis during the present season. Although there has not been placed any large original orders, many re-orders have been received, especially for heavyweight ribbed and fleece goods, and in some instances selling agents have sold their mills up for fall deliveries in these goods, as well as in some standard grades of cheaper goods.

Buyers have no complaints concerning the movement of heavy weight cotton goods, and in many ways the business

is larger than at any time within the last number of years, so much so, that many manufacturers have withdrawn their lines as being unable to take care of the orders which they already have in hand. It is almost certain that those who have not already placed orders will have to pay an advance in price for goods that they may order later, as it is evident that there is no surplus stock in the market, and the demand from the consumer is well in sight. This condition does not apply to all lines of goods, by any means, as fully 40 per cent. of the normal business still remains to be placed, and manufacturers, in some instances, are anxiously awaiting some movement on the part of buyers, more especially those that handle wool underwear. Cotton underwear is getting into a position of considerable strength both in the demand and the price.

The market for sweaters is letting up and it is believed that the high tide of this specialty has been reached. Still there is a fair demand and manufacturers whose machinery is on this kind of goods are still busy, but they say that they will have to change the character of their product to something else before long.

Very encouraging reports come from the Northwest where the merchants and people seem to be in excellent financial condition, and where collections are said to be more than good, and the outlook very promising for business.

The hosiery market is very quiet and foreign buyers are in a quandary how to act in the face of the tariff agitation, and representatives of foreign mills hesitate about accepting business at this time, and orders are taken in a way that will cover all contingencies which may arise from the tariff. One of the large buyers of hosiery who has returned from Europe says that he reached Germany when the question came up of the advance in the tariff, and that it raised a great furore in that market. The German manufacturers had just recently increased the number of machines for turning out hosiery, 80 per cent. of which was probably adaptable for the American trade, and that the advance in the tariff would very seriously effect them. He stated that the lines of goods were made up of such grades as could not very well be produced in this country. It was also impossible for any one to rush into this country previous to June or July any quantity of hosiery, as the German manufacturers were not in a position to turn out or make deliveries before those dates, the German market on desirable lines being very well cleaned up.

NEW ENGLAND MILL SHARES.

FALL RIVER MILLS.

By H. M. Haffards & Co., Fall River, Mass.

	Bid	Ask		Bid	Ask
American Linen Co..	125	127½	Merchants' Mfg. Co	125	127½
Arkwright Mills	106	107½	Mechanics' Mills		117
Barnard Mfg. Co		112½	Narragansett Mills		142½
Border City Mills		162½	Osborn Mills	116	118½
Bourne Mills	98½	100	Parker Mills	106	107
Cornell Mills	185		R. Borden Mfg. Co.	185	192½
Chace Mill	140	145	Seaconnet Mills		
Davol Mills	105	107	Shove Mills	97	99
Flint Mills		110	Stafford Mills	116	118
Granite Mills	155		Stevens Mfg. Co		
Hargraves Mills	107		Tecumseh Mills		151½
King Philip Mills		177½	Wampanoag Mills	106	109

NEW BEDFORD MILLS

By Sanford & Kelly, New Bedford, Mass.

	Bid	Ask		Bid	Ask
Acushnet Mills	140		Manomet Mills		126
Beacon Mfg. Co.	102		Nonquitt Spinning	129	
Bristol Mfg. Co	145	150	Page Mfg. Co	125	
Butler Mill	160		Potomska Mills	130	
City Mfg. Co		252½	Pierce Mfg. Co	250	
Dartmouth Mfg. Co	260		Soule Mill	170	
Gosnold Mills pf	106½	107½	Taber Mill	103	115
Grinnell Mfg. Co.	210		Wamsutta Mills	127	
Kilburn Mill	160		Whitman Mills	160	

OTHER NEW ENGLAND MILLS.

By Philip M. Tucker, 35 Congress St., Boston.

	Latest	Previous		Latest	Previous
Appleton Co.	152	148	Great Falls	204	200
Amoskeag	304	300	Hill	125	120
Androscoggin	200	202	Jackson	950	997
Arlington	137	138	Lancaster	141	140
Atlantic	85	82	Lawrence	171	170
Bates	260	250	Lockwood	101	101
Boston Mfg. Co	46	46	Lyman	120	118
Boston Duck	1395	1275	Massachusetts	133	132
Cabot Mfg. Co.	90	88	Monadnock Mills	1017	950
Chicopee	105	102	Nashua	565	542
Continental	100	94	Naumkeag	130	129
Dwight	1195	1175	N. E. Cot. Yn. com	72	72
Edwards	110	116	Pepperell	805	801
Everett	135	130	Trem't & Suffolk	129	112
Franklin	100	bid	York Mfg. Co.	135	138

Arlington is selling ex-rights, which sold from $8 to $10.

Boston Mfg. Co. has not been quoted publicly for a long time, private sales from $75 to $80.

Franklin Company paid 70 per cent. extra dividends and is now $100 bid;

SOUTHERN COTTON MILL STOCKS.

Quotations by F. C. Abbott & Co.,

Charlotte, N. C.

	Bid	Asked		Bid	Asked
Aiken Mfg. Co.	75	85	Lanett	97	
American Spinning	150		Langley Mfg. Co.	96	95
Arkwright Mills			Linden, N. C.		94
Arlington		166	Limestone	140	
Avondale			Loray, pref 1901	95	99
Augusta, Ga.	60		Lowell		
Bonnie	121		Mooresville, N. C.	125	
Bloomfield	108½	118	Lumberton		226
Brandon Cot. Mills	145		Mills Mfg. Co.		104
Brookside	108	108	Modena Mills		115
Capitol City, pref.		78½	Mollohon	95	105
Chadwick-Hoskins Co.	95	100	Monarch, S. C.	100	111
Clara		121	Newberry		146
Clover			Nakomis, N. C.		156
Clinton			Olympia, 1st		86
Clifton, pref.			Ozark	125	150
Cliffside	165		Patterson	115	
Chiquola Cot. Mills	158		Piedmont Mfg. Co.		171
Cherokee Mfg. Co.			Pelzer	152	152
Converse	168½		Pell City, com		95
Dallas Mfg. Co., Ala.	95		Pell City, pref.	100	
Dillon	65	68	Saxon		126
Efird, N. C.	125		Sibley, Ga.	60	
Elmira, pref.	95		Social Circle	99	
Eagle & Phoenix		121	Spartan Mills	128	130
Easley	153	155	Springstein		
Edenton, N. C.			Statesville Cot. Mill	107	
Exposition		240	Trenton, N. C.		
Fairfield	75		Tryon, N. C.		143
Florence, N. C.		181	Tuscarora	115	
Gaffney Mfg. Co.	76	75½	Tucapau, S. C.	200	
Gaston		105	Toxaway		92
Gainesville	66		Union Buffalo, 1st pref		71
Gibson	75		Union Buffalo, 2d pref		21
Graniteville, S. C.	165	168½	Victor Mills, S. C.		125
Gray Mfg Co.	121	126	Warren Mfg. Co., pref	103	
Grendel		119	Washington Mills	28	30
Greenwood	50	71	Washington Mills pref.		108
Highland Park		170	Watts		86
Hartsville, pref.	100		Wareshoals		
Hartsville			Whitney	123	125
Inman Mills S. C.		107	Wiscassett	125	
Kesler	135		Woodside	101	103½
Jno. P. King Mfg. Co.	91½		Woodruff		135
Lanaster, com	125		Williamston	106	106

THE COTTON YARN MARKET.

Since your last report there has been a decided change in the prices of yarns of all kind. At the last report there was practically no market for yarns, 16/2 ply skein having been sold as low as 14½ cents; 20/2 ply warps and skeins as low as 15¾ cents; 20/1 warps at 15½ cents. To-day a number of the mills are marking up their prices with the advance in cotton, and the variation in quotations for the same number will oftentimes be as high as two cents a pound, in the course of a day.

The situation is this: The bulk of the trade has anticipated its wants, and has been disappointed in not getting the orders for its own goods, which it has expected. It is very hard to force deliveries, and, in a great many instances, a number of the buyers have advised that they

have yarns to sell, and there have been a great many resales. In a great many instances, the buyers are covered ahead for months to come, and some very low-priced orders have been booked during the summer.

It is difficult to name market prices which would be acceptable all around to-day on account of the difference of opinion of the various mills and their holdings of cotton.

A great many of the spinners who have cotton at nine cents and thereabouts, are anxious to run their mills, and are naming prices based on the cost of cotton at that price. On the other hand, mills which have not cotton are basing their prices on to-day's market. We know of very little business resulting from quotations based on to-day's market, as the buyers feel that it is speculative.

The demand for yarn for the next six to eight weeks promises to be quiet, but indications point for a good fall business.

SOUTHERN SINGLE SKEINS.

4s to 8s	15	22s	18
10s to 12s	15½	26s	18½
14s to 18s	16	30s	20 @21
20s	17		

SOUTHERN TWO-PLY SKEINS.

4s to 8s	15	30s	20½@21
10s to 12s	15 @16	36s	23 @24½
14s	15½@16	40s	24 @25
16s	16½@17	50s	29 @30
20s	18 @18½	60s	35 @36
24s	18½@19	3-ply 8s upholstery	15
26s	18½@19½	4-ply 9s upholstery	15

SOUTHERN SINGLE WARPS.

8s to 10s	15 @16	22s	17½@18
12s	15½@16	26s	18½@19
14s	16 @16½	30s	20 @20½
16s	16½@17	40s	23 @25
20s	17½@18		

SOUTHERN TWO-PLY WARPS, ETC.

8s to 10s	15½@16	26s	19 @19½
12s to 14s	16 @16½	30s	20½@21
16s	17	40s	24 @25
20s	18 @18½	50s	30 @31
24s	19 @19½		

SOUTHERN FRAME PEELER CONES.

8s	15½@16	20s	18 @18½
10s	16½	22s	18½@19
11s	16¾	24s	19 @19½
12s	17 @17½	26s	19½@20
14s	17½	30s	21
16s	17½	40s	24@24½
18s	18		

The Textile Mill Situation in New England and the South.

NEW ENGLAND MILL SITUATION.

(Special Correspondence.)

There have been many favorable developments in the New England cotton mill situation during the past four weeks, and as direct result the almost general feeling of optimism has become stronger and more pronounced. Prices of plain goods have held firm at revised prices, while fancy goods have strengthened slightly because of the better buying, and yarn holds the improvement noted last month. Textile machinery manufacturers are cheerful with orders being placed daily for early fall and winter delivery. Textile stocks have reacted slightly — a most healthy and desirable condition.

Among the many favorable developments during the month of May was the return of seasonable weather with a marked degree of interest in seasonable fabrics by the consumers. Retailers all over New England report the return of women shoppers with well filled purses and strong inclination to buy the season's fabrics. This is the strongest indication possible of a return of prosperity. Students of industrial and financial economy agree as a unit that the housewife is the most reliable barometer of the economic condition of a community. With her return to the retailers' counters, sales by the retailers must result also by the jobbers, by the converters, and so on down to the man in the cotton field. The better feeling among the retailers is probably as favorable a condition as has developed for some time. Everybody feels the impulse of this, sentimentally at first, but practically and materially later.

Another favorable development is the price revision announced during the second week of May by the different selling houses in the primary markets on prints. This establishment of a re-sale price on prints encourages jobbers and retailers, and will accomplish the same good results that the Amoskeag people accomplished on their products when they established re-sale prices some months ago. The tendency of the times is for each economic factor to secure fair margin of profit, and the only way to accomplish this result is by establishing a re-sale price with penalty for violation. This is being done in many branches of manufacturing and can be advantageously applied to cotton manufacturing. It is not violating a federal, state, community, social, moral, or economic law, but is an act of progress brought about by the simple law of competition.

The demand for summer goods improved greatly after the middle of May because these goods were taken out of the primary markets by the jobbers and pushed with greater vigor as the seasonable weather developed. Jobbing house report a satisfactory number of re-orders and are well satisfied with the market. Jobbers do not hesitate to state that they are willing to carry goods at present prices, over to another season, because they believe that prices one year from now will be from 20 to 30 per cent. higher than to-day. Everything certainly indicates such a condition, and it must be admitted that jobbers are excellent judges of the cotton situation. Ginghams and napped goods are in the hands of jobbers and staples are well sold up. These goods are out of the market and the waiting period is now in force. Bleached goods are moving slowly in jobbers' hands, the demand from manufacturers on the made-up line, such as sheets and pillow tubings, has been one of the season's features. Brown sheetings are sold into the late summer months and jobbers believe another month's business will take care of the fall production. Prints have been quiet in the primary markets but quite active in the secondary. As a unit the print market is in excellent condition and the future looks encouraging. Sidebands are in particular request at satisfactory prices.

The market for goods for export has been very unsatisfactory this past month. China has not been interested in our goods, buying presumably from Spanish and Italian factors who are inclined to under-quote us on spot goods. Quite a few drills have been shipped to the Red Sea trade on orders placed in the early spring months for

May delivery, but new orders are rather scarce. There is an inquiry in the market now for 12,000 bales of standard drills, There have been more orders from South and Central America, but the quantity ordered is unsatisfactory. Prices are good however.

The most serious problem with the manufacturer to day is not where to sell his goods but how much he will have to pay for raw cotton. Not for months has the cotton market displayed so much strength as for the past month. There is ample reason for this strength and the spinner knows it. There is little doubt but that the Texas crop will be injured by the excessive drouth and in the eastern and central sections of the belt there have been unfavorable reports for several weeks. The greatly increased spindleage of this country from now on must result in one of two conditions, either raw cotton will be very much higher than prevailing prices or a greater acreage will have to be planted. It is probable that the former condition will exist. Over one million spindles will be added in New England this year. This means about 170,000 bales per annum required for this increase. Among machinery makers there is a very cheerful feeling. Many large contracts are being signed daily at prices that show a round margin of profit. The Draper Co. have closed a contract with Pepperell Mfg. Co., of Biddeford, Me., for $500,000 worth of looms and other machinery. Crompton & Knowles claim that the silk business is the brightest spot in the textile industry and are rushed to their capacity with orders for silk looms and dobbies, Whitin Machine Works are doing a very large business in the South and have recently taken several big contracts for New England jobs, and so one might chronicle prosperity throughout the entire list of textile machinery manufacturers. The American Moistening Co., is doing a record-breaking business, while the Universal Winding Co. report many large and valuable contracts. The writer talked with a great many machinery men at the recent exhibit at Boston and found them optimistic to a man.

Loom builders such as Mason Machine Works, Stafford Co., and Kilburn, Lincoln & Co., are booked well ahead on orders that show a good margin of profit. The recent demoralization of the metal markets helped out textile machinery builders greatly, it is said.

The labor market in New England is not quite as satisfactory as it might be. There is a scarcity of the better class of textile help because of the grand exodus of aliens to their foreign homes last year when the business depression was the most pronounced. However immigration is now running ahead of last year and the best months of the year are in store for us, so it is probable that this condition will adjust itself without further effort on the part of cotton manufacturers. There are no labor disturbances in the air anywhere in New England.

The reaction in the market for cotton mill stocks is welcomed by every one who studies the textile shares market. Prices advanced altogether too rapidly to hold and became unjustifiable and not at all based upon the investment return. When cotton mill stocks sell on a 4 per cent. basis without any immediate prospects of increased regular or an extra dividend it is time to call a halt. No doubt the large advances scored in this market since early spring was due to buying by investors who desired to hold securities on May 1st that were tax free in the state of Massachusetts, and now that the tax question is settled for another year the market has lost its greatest purchasing power; in fact, the market has had to absorb some of the securities purchased by tax dodgers who buy in April and sell in May. The decline of several points in Androscoggin is explained by the sale of a block purchased the middle of April by a notorious tax-dodger.

Since May 1907, Amoskeag has advanced $44 per share, Androscoggin has advanced $42.50 per share, Bates $20., Continental $37., Hamilton Cotton Mills $65., Massachucetts $28., Pacific Mills (par value $1,000.) $580., and Naumkeag Steam Cotton Mills $40. In May 1907, prices were based on dividends actually earned; to-day, prices are based upon anticipated earnings and dividends. If everything turns out as anticipated current prices will be well warranted and in many cases may be cheap. It is probable that earnings in 1909 and 1910 will be greater than in 1907 and 1908. On the other hand, textile mill stocks are selling high enough and further speculation should be discouraged.

In the Fall River market there are very few offerings of stock, in fact, so scarce are offerings that a local broker has taken on other lines of investment securities to tide over the dullness in textiles. Prices are holding firm with bids of several points above the last sale for the higher grade Fall River issues. New Bedford stocks are very scarce and ruling bids are anywhere from two to fifteen points above the last sale. There is a splendid demand for the stocks of the new cotton mills being constructed in New Bedford, and it is probable that two new mills will be announced later on because of the ease in the money market.

General New England cotton mill stocks are not being pushed for sale because of the general confidence in the industry. The main stocks were invariably selling too high and unless dividends are increased in June and July there will be a material reaction in some of the issues that are selling on a 4 per cent. basis.

SOUTHERN MILL SITUATION.

(Special Correspondence)

The situation affecting the textile industry in the South, while materially improved over that of a few months ago, is still far from satisfactory. Especially has the improvement been slow in yarns. Irregularity of prices and demand have marked dealings for the month past, and to-day the markets are in an unsettled condition. In the opinion of men prominently identified with the trade, further curtailment is the only salvation, one prominent manufacturer giving it as his firm belief that nothing short of 20 to 25 per cent. of curtailment among hard yarn mills will have the effect of restoring normal conditions.

In some lines there has been unmistakable improvement, notably in the cloth business. The cloth mills, generally speaking are well supplied with orders. There is a disposition among the mills to hold for higher prices, and it is believed they will get them. Export business is better than for two years past. Numbers of large orders for foreign shipment have been placed, and many of the mills catering to the export trade have sold up a year in advance at prices which show profit. The advance in cotton is attributed by one prominent mill man to

this improvement in export demand. The fact that a large amount of business is being sold abroad has had the tendency to benefit the home market in using up the surplus and thereby creating a stronger demand. This also causes the mills to buy from 25 to 33 per cent. more cotton than they would need in the manufacture of lighter goods.

The past week or so has witnessed some improvement in yarns. Demand is steadier than was the case a few weeks ago and a high raw material market is serving to still further strengthen cotton yarn values. Spot demand is stronger than formerly, and besides the improvement here, buyers are also showing more interest in yarns for forward delivery. If sellers were willing to accept orders for future delivery at current prices, they could put through an excellent business, but there seems to be a disposition to hold more firmly to stock in hand rather than to push sales at concessions. Weaving yarns are in somewhat better request, also, and with the starting up of retail business on cotton wash fabrics, weavers will have to come into the market again.

As a result of the meeting of the State Farmers' Union at Columbia, S. C. recently a committee has been appointed to go to Washington to consult with the President for the appointment of a representative to visit the various foreign countries and study the cotton situation.

Chief interest centered about the meeting of the American Cotton Manufacturers' Association at Richmond recently. Yarn men seem very much interested in the proposition for a new form cotton yarn contract, and certain well-known men identified with the yarn trade have been advocating a new contract.

There is no let up in the chartering of new mills. From all quarters of the South reports come of the organization of new mills, and of the commencement of improvements in established plants. Last year was notable for the heavy shrinkage in new mill construction work, and from present indications this year will be noted as a record breaker along this line. Several large mills have recently been put under way; viz. contract was let a few days ago for the new 50,000 spindle mill which the Duke interests will build at Durham, N. C. Other large mills have been reported, and it would seem that capitalists have an abiding faith in the future of the industry, and are willing to invest their money freely even though conditions are far from favorable.

In an interview with Mr. S. B. Tanner, ex-president of the American Cotton Manufacturers Association, in regards to the cotton, yarn and cloth conditions at present and for the future he had this to say:

"There are so many different reasons attributed to the recent advance along the lines you have mentioned, that I can hardly give any one definite reason. It is true that there has been a material advance in cotton and this can be attributed, to a great extent, to two things, namely, the export cloth business and the farmer. The cloth business has seen a material improvement and the mills, generally speaking, are well supplied with orders. They are holding for higher prices and they will get them, although at present the prices offered are not at all in proportion to the advance in cotton. One mill that I have in mind has sold ahead for a year from the coming June and the manager tells me that he got a good profit based on what he paid for cotton at the time. This case is an exception though, and there are very few orders of this nature being placed. There is a much larger demand for export cloth at present than we have had for several years and as this grade of goods is much heavier, there is more cotton used in the manufacture of it than in the lighter grades. In sending so much of this class of goods out of the country it leaves the home market in a much better condition to use up the surplus cotton and yarns and thereby create a new demand.

"On account of the rapid advance in the price of grain and food products, the farmer has had to plant a certain per cent. of his cotton land in grain and provisions, devote more of his time to raising cattle and spend a lot less time in producing cotton and this has cut down the cotton acreage a great deal and has done its part in advancing the price of this staple.

"Then too, the drouth in Texas that has been talked about so much for the past several months still continues and as the season has already passed for the early planting, the cotton world is beginning to fear we may have a short crop. This has helped the situation a great deal or at least, has made it doubtful, and as the quality of this crop is better than we have had for several years, a great many manufacturers feel that they can afford, around the present prices, a little more than they really need."

In speaking of the hard and soft yarn mills and the cause of their recent hardship, Mr. Tanner had this, among other things, to say:

"The hard yarn mills have suffered more, probably than any others and there are several good reasons for this. Last fall, when there were rumors that a number of big buyers were in the market, a great many hard yarn mills started up running night and day. These mills by starting in advance of the demand, accumulated a great surplus of yarns that the demand, at prices at that time, was not able to use up and this surplus was left on their hands. When the buyer found that such a surplus existed he immediately cut his price offerings and lots of the mills finding themselves in serious financial straits had to sell at their prices. They are forcing the market for their products to a better basis now by curtailment which I think will average about 20 or 25 per cent. Curtailment is their only salvation and if they will continue along the line they have adopted, there is no reason why they should not be in good condition in a short while. The advance in other grades of business is helping them and if they will help themselves it will not be long before the market will resume its normal condition." The soft yarn mills were in better condition than the hard yarn mills for the simple reason that they are better organized and are more loyal to their organization and were by a concentrated move, able to curtail and avert the disaster that overtook the hard yarn men.

"We do not look for the tariff to have much effect on the imported cloth business for we do not look for any reduction on this class of business. Foreign countries are able, on account of cheap labor and cheap machinery, to manufacture the coarse cloth at a great deal less cost than we in this country can and of course if there is a reduction in the tariff along this line, these countries will immediately flood the American market with these goods and that would go hard with the home mills in case there came a season of dull trade. I think the tariff will remain about what it was in the old bill in regard to the coarse cloth and don't think we have anything to fear along that line.

"The cloth mills did not suffer much in the panic for the reason that they waited until there was a demand before they started up. Many of them had secured contracts before the panic started to last them through it and these were not hurt in the least. The demand for their product is good and they are issuing just enough to supply it. When a buyer knows there is a low supply of anything on the market he is slow to make offers, not because he wants to depress the market, but because he is afraid his neighbor will buy cheaper than he did. The cloth mills have kept the supply down to the demand and therefore have been in a position to get a good price for their goods.

"All the markets are in better condition than they have been for some time and there is no reason why they should not continue to advance. It is all with the operators and they can make it what they will."

With the advance in the cotton market has come the buyers and from the orders already received by some of the most important mills in this section in the past few days it is generally thought that the advance will continue until the yarn prices are equal to the raw material. Prices in the cotton yarn market are still up to the 11 cent per pound average and other advances in the market are having the effect of creating a general feeling of content and optimism among the hard and soft yarn spinners. This week has seen an advance in prices that is considerably higher than any quotation for some time and the spinners are making at least one per cent. per pound more than the highest quotations in either this market or those in Boston or Philadelphia. In the local market buyers are still taking two-ply 20s skeins at 17½ cents, while the spinners have closed down on all orders for the same numbers that are less than 18½ cents. This is just an instance showing the general trend of the market and there are other numbers that are showing the same advance.

There are a few dealers in the market who are willing to accept small orders but the number of these mills is so small that their acceptance of this business will not affect the general advance. Buyers are still offering prices which they refused to pay a week or 10 days ago and generally speaking, the market is on a much higher basis all around. The advance made by the buyers can be accounted for to a certain extent, by the fact that several large weaving interests are making inquiries with a view to coming into the market for supplies. Other weavers are buying quietly for near-by deliveries as they are not yet ready to pay the advances named for the forward contracts.

That some strong advances are looked for in the near future is shown by the knitters coming into the market more frequently. Lately their yarns have shown advances on several numbers and now they are trying to cover ahead at the lowest prices the spinners will name. The general business makes a more decided showing as a whole at the present time than this market has seen since the panic started.

At 10 o'clock on Thursday morning May 27, mill superintendents and others interested are to gather at the Lowell Textile School to see the completion of a series of tests that have been in progress for the past two months of various types of pulleys.

These tests originated because of the interest of certain parties located in Lowell in the claims made that Cork Insert Pulleys would transmit far more horse-power at a given belt tension than any other type of pulley and it is apparent from a perusal of the records of the tests that the claims have been borne out.

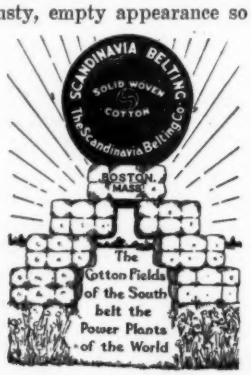
In order than the parties interested may see the several types of pulleys tested under their own eyes, the final test is to be a public one and all parties interested in the economical transmission of power by belts are invited to be present.

NEW MACHINERY AND TRADE NOTES

SCANDINAVIA BELTING.

"Scandinavia" is the trade mark of a belting for transmission, conveying and elevating, manufactured by the Scandinavia Belting Co., Boston, New York and Denver. The belting is a solid woven, treated cotton fabric, made upon power looms. Each strand of the cotton is subjected to severe stress during the entire process of weaving, and is of absolute uniformity in thickness, of like construction inside out, and possessing wonderful strength and elasticity. It is not affected by atmospheric conditions, being impregnated with a special composition, and has no laps to open up. The impregnation is a special feature of the belt, and the composition used is such as to give the belt a superior grip, keep it well lubricated and pliable, and render it impervious to moisture of any kind. It is not only surface-hardened but is anti-frictioned throughout. The price for the belting is much lower than that made from leather. It is successfully and economically used in such establishments as iron and steel works, machine shops, paper mills, pulp mills, dye-houses, textile mills, and lumber mills.

BRILLIANTONE, a finishing compound for piece goods, hosiery, yarns, etc., is an article of much merit. This article acts both upon the dye and fabric. It develops all blacks and colors into level bloomy shades, and gives to the fabric a superb lustrious finish and handle. As a hosiery finish, is causes soft yarn to look like lisle. The familiar shabby, rusty, empty appearance so frequently seen


SCANDINAVIA BELTING
SOLID WOVEN
COTTON
The Scandinavia Belting Co.
BOSTON, MASS.
The Cotton Fields of the South belt the Power Plants of the World

in sulphur and direct blacks is entirely removed by its use, and the color developed into a rich, full and bloomy

black. All hosiery treated with it acquires, upon pressing, a superb lustrous finish, as does piece goods upon calendering. It produces a characteristic tone of shade and finish which can not be produced by the use of dyes alone. This compound is manufactured only by Scholler Bros. Co., Amber & Westmoreland Sts., Phila., Pa., who manufacture a full line of high grade textile soaps and softeners and specialties for dyers, bleachers, printers, finishers and the knit goods trade.

GREAT IMPROVEMENTS IN STOCK DRYING MACHINES. The stock drying machines commonly in use heretofore were crude affairs compared with the machines that are now being built. The old machines were constructed of wood, they had the fan bearings inside in the heat, the stock was carried through on an endless wire screen which revolved about wood or sheet iron drums at either end, and the apron or conveyor was a continual source of annoyance, trouble and expense. The drying machines that are now being turned out by the Philadelphia Textile Machinery Company, Philadelphia, constructed entirely of metal, the framework is made up of structural steel put together in accordance with the most approved engineering practice and the panels are made up of two sheets of metal with asbestos air cell between. The fan shafts are so arranged that all the bearings are outside the enclosure away from the heat where they may be reached at any time by the operators without shutting down the machines. In place of the old apron which was such a source of trouble this machine has in it what is called the "interlocking chain and conveyor," which needs no adjustment. This conveyor is guaranteed to run straight and true and requires absolutely no adjustment when once it is placed in the machine. It consists of a pair of endless chains connected together by cross-rods, the carrying portions being made up of separate interlocking sections of galvanized iron wire cloth so constructed that the sections do not bend in passing around the sprocket wheels. This new conveyor will wear for a long number of years and during its operation is absolutely no trouble whatever. It operates more on the principles of coal handling machinery. The Philadelphia Textile Machinery Company has put out a catalogue containing about thirty cuts of this new machine. Many people are replacing the old type wooden machine with this new steel dryer.

THE CELL DRIER MACHINE CO., Taunton, Mass., will, in the future, represent in this country Lang Bridge, Ltd., Accrington, England, general finishing machinery; Samuel Walk & Sons, Ltd.; S. Spenser & Sons, warp mercerizing machinery; Ernest Lehman, waste and fiber machinery; some special things manufactured by Pickup & Knowles; and Goffard & Co., builders of suction extractors for the woolen and worsted industry.

THE ACME STAPLE COMPANY, LTD., has removed its entire plant and offices to 112 N. Ninth St., Camden, N. J., where, with improved and increased facilities, it will prepare to meet the requirements of the trade.

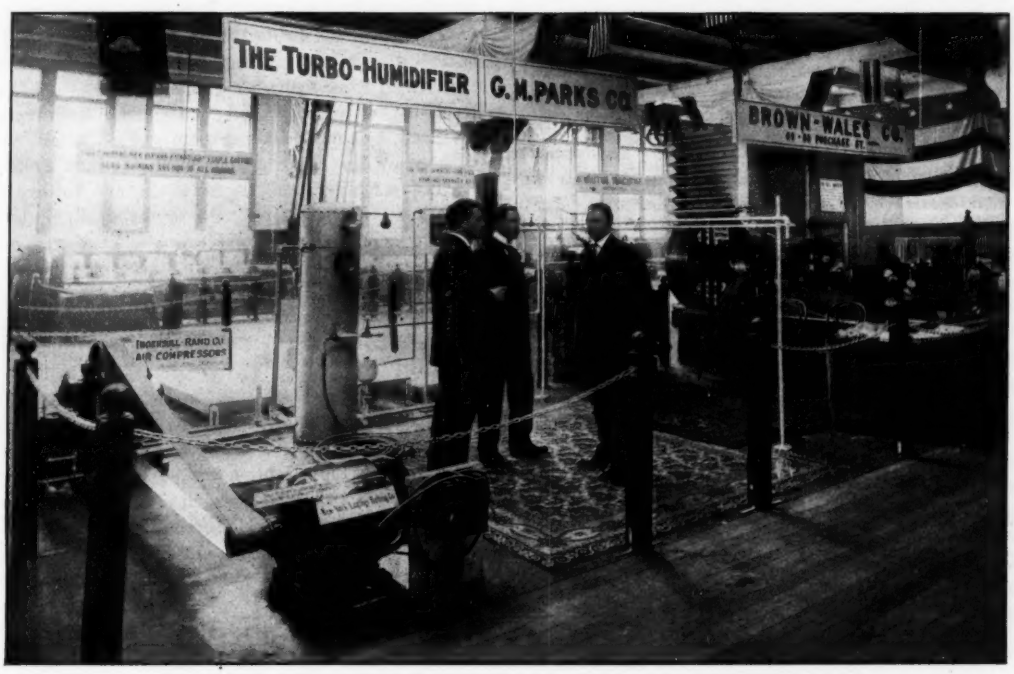


EXHIBIT OF G. M. PARKS CO., AT BOSTON MEETING OF NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

SIZING WARPS IN THE CHAIN SYSTEM.—This may prove very costly, because the right kind of size is not used. Any practical worker knows what trouble it is especially when the threads stick together. The Arabol Manufacturing Company, New York, meets all difficulties by three modern, scientific, specializing methods. Three soluble softening oils, and "sizeoleum" are used with great success by Southern and Northern mills on goods mixed either with corn or potato starch. On print cloth warps, sheetings and domestics, the "sizeoleum" has been found to be a most reliable and superior compound, but no tallow must be used with it.

INDUSTRIAL FILLER EQUIPMENT.

Southern cotton and hosiery mills, operating their own dyeing, bleaching and finishing plants, will be interested in learning that the Roberts Filter Manufacturing Company, Philadelphia, has just completed the installation of the filter equipment for the city of New Orelans, La. This filter plant has a daily capacity of 40,000,000 gallons, and is considered a model plant in efficiency and scientific operation. Some of the most delicate and accurate filter controlling apparatus known is used in operating this huge system.

Other city plants recently installed by this filter company are those at Manchester, Va., Decatur, Ala., Columbus, Miss., Farmville, Va., Sanford, N. C., and Henderson, N. C.

At the present time this company is completing for the American Sugar Refining Company, at Chalmette, La., a filter plant equal in size to most any city plants.

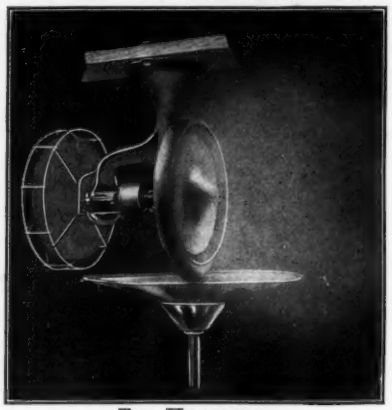
While the Roberts Filter Manufacturing Co., installs the largest kind of city and industrial filter plants, it must not be supposed that it neglects the business of the smaller textile plants. In fact, its large general filter business enables it to devote a special department to this smaller but equally important, business. In proof of this it may be said that highly satisfactory plants have been designed and installed by it for the Richmond Paper Company, Richmond, Va.; North American Lace Company, Philadelphia, Pa.; Auger & Simon Silk Dyeing Company, Paterson, N. J.; Cluett, Peabody Company, Troy, N. Y.; Cawley Clark & Company, Newark, N. J.; Stott Woolen Mills, Stottsville, N. Y.; Capron Knitting Company, Utica, N. Y.; Omo Manufacturing Company, Middletown, Conn.; and the Georgia State Sanitarium, Milledgeville, Ga. All these plants are designed with a view to the most economical operation consistent with the highest efficiency.

In these days of close competitive methods it may be of interest to know that this filter company makes a close study of local water conditions in order to produce the highest form of economical and efficient water filters, and this is a matter of more than passing interest to Southern mills contemplating the purchase of filters for purposes of mill economy, convenience and elimination of time lost in shipping North for finishing.

Only recently the Roberts Filter Manufacturing Company has completed a very desirable and instructive catalogue on water filters and the problems of pure water for industrial purposes, and if any of our readers is interested in this, a postal to this effect will insure his obtaining a copy free of charge.

THE HYGROSSO.

The "hygrosso," illustrated herewith, is an improved type of spray humidifiers. It differs from previous types in that the spray is obtained by centrifugal force instead of pressure pumps, and eliminates the necessity of special and expensive pumping systems under heavy pressure. It also has the addition of a fan which circulates the air so as to mix with this spray, and greatly increases the evaporation. The fan has the advantage of distributing the moisture thoroughly, and securing uniform results throughout the room and producing the greatest possible cooling effect. The apparatus may be driven by a one-inch belt from the shafting and requires only one-eighth horse-power which taken from line shaft, is regarded as the cheapest obtainable and makes the cost of operation trivial when compared with contrivances requiring special forms of power for operation. One-fourth of the water used is evaporated, and the average amount supplied to each head is about twelve gallons per hour. The water



THE HYGROSSO.

may be taken from any convenient line in the mill, since it requires no pressure.

The water is fed into the hollow of the disc, which operates inside the cast iron case, and is thrown with such centrifugal force against a copper grid that it is pulverized to the finest possible mist. This mist is readily absorbed by the air which is being constantly brought in contact with it by the fan.

The machine is of the most durable construction possible. All parts are exposed to the open, nothing is enclosed, and are easily accessible. There is no chance whatever for the accumulation of foreign matter to produce unsanitary conditions. It is practically impossible for the drain to clog, since the fan discharges directly over drip pan, keeping the opening free from the accumulation of "fly."

There are no wet cloths, spray nozzles, pressure blowers, strainers, etc. It's a simple piece of mill machinery made with the greatest care and of the best material. They only require the attention necessary to any piece of running machinery. The revolving disc is made of heavy spun copper, fan or nickled steel, drip pan of spun copper, guards of heavy enameled brass, case and hanger of cast iron. With ordinary attention, the apparatus should last indefinitely,

Each humidifier works independently of the others, and should any trouble be experienced with one machine, it would not be necessary to stop the whole system and lose the result of the same until necessary repairs are made.

The "hygrosso" can be installed so easily that it may be used to good advantage to supplement other systems which are not producing enough humidity, and it can be done at a small cost. It also fits in nicely for some departments of mills which have been neglected in the past on account of the necessity of the special forms of power required for operation, which would make the cost of installing humidifiers excessive.

While not a cheap humidifier the "hygrosso" when compared with other systems as to cost and maintenance, and figured on a basis of an investment for a period of years, is said to be less expensive in the end.

The "hygrosso" is made to operate by belt or direct connected motor which can be furnished for various forms of electric current. The manufacturers will be pleased to furnish any information desired to mills considering an installation of humidifiers. A new booklet pertaining to humidifiers in silk mills is now in the hands of the printers and will be forwarded to manufacturers on request. The "hygrosso" is manufactured by John W. Fries, sales office 45 Lafayette St., New York.

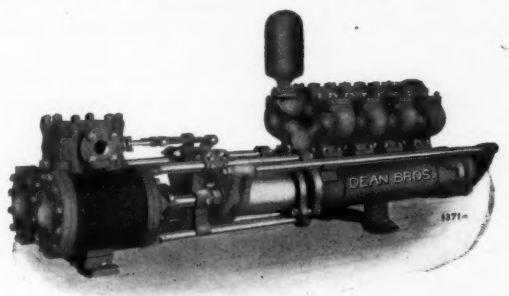
DUPLEX PUMP.

The pump here shown has outside end packed plungers which are designed for feeding boilers, pumping water containing sediment or grit, working on oil lines, hydraulic presses, and for mining purposes.

Plunger pumps, especially under the higher range of pressures, have certain advantages over "piston" pumps. They are remarkably durable, the only wearing part in the pump-end being the packing of the plunger stuffing boxes. No leak can occur there without being observed, and is easily stopped by setting up the packing. The plunger not touching the pump castings, there is no cutting or wear, consquently they require no reboring or refitting when working on gritty or sandy water.

The piston rods do not enter the pump cylinders, and are, therefore, not exposed to the action of the water.

The rods, supporting the plunger, slide in babbitted bearings. The valves are in pots and are quickly accessible by taking off the plates over them.



DUPLEX PUMP.

The steam cylinders are of a new type. The steam ports are arranged on a novel plan. The method of steam cushioning is new, and the valves are of an original form. It will not short stroke. The pump makes full stroke, and, therefore, overcomes a serious objection to duplex pumps. When a pump runs at half stroke, it uses the full amount of steam but only delivers half its capacity of water. This pump is of usually long stroke for a duplex pump.

The valve gear is extremely simple and not liable to injury or wear, and can be replaced at very little expense or trouble.

It is covered by patents. Rock shafts are abandoned and one piece levers are substituted. The levers swing on steel studs having extra long bearings. Both levers are alike and they can be removed and replaced in five minutes. Is is manufactured by Dean Bros. Steam Pump Works, Indianapolis, Indiana.

FARBENFABRIKEN OF ELBERFELD CO., New York. This company has issued a number of color cards as follows: *Alizarine Navy Blue W paste,* intended for wool-printing, the effects of which are very even and rather fast to light and washing; *Algole Red 5G* in paste, dyed in the hydrosulphite vat and yields clear yellowish pinks or from salmon to brick shades of scarlet; *Katigen Deep Black B W, Katigen Deep Black W R, Katigen Deep Black F F,* the first two being distinguished by their excellent solubility yielding very full bloomy shades of black, the third or latter one has the advantage of approaching aniline black, all three brands being exceedingly well adapted for the dyeing of loose cotton, cops and cheeses in the machine; *Benzo Fast Scarlet 7 BS* which yields a full bright red and can be employed for the dyeing of loose cotton, yarn and piece goods being of good fastness to acids and is suitable to mercerized materials; *Para Brown R,* which is dyed in the jig or in the dyebeck with glauber's salts and soda ash and then rendered fast to washing by developing on the padding machine with Paranitraniline.

THE UNITED STATES PRINTING COMPANY'S NEW PLANT.

With this issue we present in the advertising section a colored illustration of the new label printing plant of The United States Printing Company, which plant just completed is located at Norwood, a suburb of Cincinnati, Ohio. The company for many years has operated two factories in Cincinnati, but about two years ago the volume of its business had expanded to such an extent as to require additional space. The directors of the company then decided to construct a model plant of sufficient size to provide for the company's increasing business and to include in its specifications the most modern, personal accommodations for its large force of skilled workmen. Norwood is a modern, clean, picturesque suburb of Cincinnati, located about seven miles from the heart of the city, with excellent transportation facilities, and in order to give its working force the benefits to be derived from living and owning homes in such a desirable and convenient place, it was decided to locate there. A ten acre block, an ideal site, was purchased and the construction of the new plant was commenced about a year ago. During the last six weeks the removing of the machinery and stock from the buildings in the city has been in progress, and on Saturday, May 22, the final department, the office force, was transferred and duly installed in the commodious quarters reserved for that purpose in the main building of the new plant. This main building is four stories and basement. 300 x 377 feet, and is of reinforced concrete construction with brick facing. It is strictly fireproof throughout. In this building are housed all departments excepting those of steam and power and one other, for which a separate building was constructed.

This is unquestionably the largest label printing plant in the country, if not in the world, and it is said that with the present capacity, facilities and accommodations, the company will be able to meet the requirements of the most exacting purchaser of its products. While label printing, from the ordinary high grade colored work to that of fine gold bronze printing and embossing, is its chief specialty, it does a large business also in folding boxes, booklets, posters, advertising cards, cut-outs and an almost endless variety of other forms of colored advertising work.

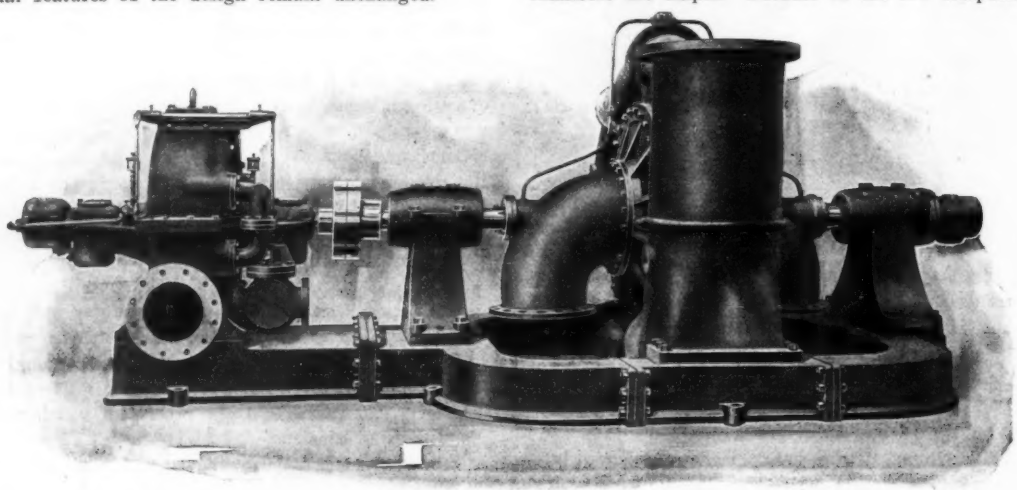
UNIVERSAL WINDING CO., BOSTON, MASS. This company has issued a beautiful catalogue relating to its "Universal" winding machinery which is complete in its adaptation to the entire range of textile machinery for which winding is required, from rope in seventy-five pound cylindrical packages to fine insulated wire in disc form the size of a wafer. Many types of these machines have been made for special purposes, such as winding cops for use in sewing machine shuttles, tape on tubes for shipment, displacing spools, bobbins for use in braiding machines, paper twines asbestos, tinsel cord, copper wire, etc.

THE TERRY LOW SPEED STEAM TURBINE FOR BELTED OR DIRECT CONNECTED SERVICE.

The rapidity with which, during the past few years, the steam turbine has been accepted and introduced as standard for central station and isolated plant service, is abundant evidence that it has real and practical advantages. The uniform rotary motion of the one revolving element of the turbine is fundamentally simpler and more effective than the reciprocating motion of the several moving parts in the steam engine.

The designer of the Terry steam turbine had in mind two essential features: to produce a first efficient small low speed machine, and secondly one of the very simplest design. The unusual low speed of the Terry turbine permitted direct connection without the attendant troubles, at the same time eliminating gears; simplicity meant successful operation with but few parts, all easy to inspect.

The success of the Terry turbine during the four years that it has now been in commercial operation, is best attested by inspection of any of the units totalling 20,000 horse-power now in running under usual service conditions. Modifications have been made in some details but the essential features of the design remain unchanged.



The Terry turbine is of the compound velocity stage impulse type, that is the steam is practically wholly expanded in a correctly formed jet or nozzle, wherein its static pressure is converted into velocity energy. This energy is delivered to the wheel as useful work in the following manner:

The wheel is fitted with semi-circular buckets as shown in the accompanying engraving. The steam escaping from the jet strikes one side of this bucket, and is reversed in direction leaving the opposite side of the same bucket, then enters the first stationary bucket or reversing chamber. This chamber re-directs the steam back again into another bucket of the same wheel at a point adjacent to the jet. This operation is repeated as many times as necessary for the complete utilization of all the available energy in the steam, its velocity being extracted successively in each reversal or stage.

As the flow of steam into and from the bucket is at all times in a plane normal to the shaft there is therefore, no end thrust regardless of initial pressure or vacuum.

Increased power for a wheel of a given diameter is obtained by fitting additional jets and reversing chambers in the casing, each jet of course, being supplied with live steam. When partial load is to be carried at times, one or more of these jets may be turned off by hand operated valves to give full load efficiency.

It will thus be seen that all the advantages due to increased economy of the multiple-wheel turbine are obtained with the obvious mechanical advantages of the single-wheel turbine.

Furthermore, as the steam is expanded in the nozzle, the turbine casing and wheel are not subjected to high pressures or super-heat, which may be effectively employed to improve the efficiency, but only to those corresponding to the exhaust pressure. Thus radiation losses are reduced to a minimum.

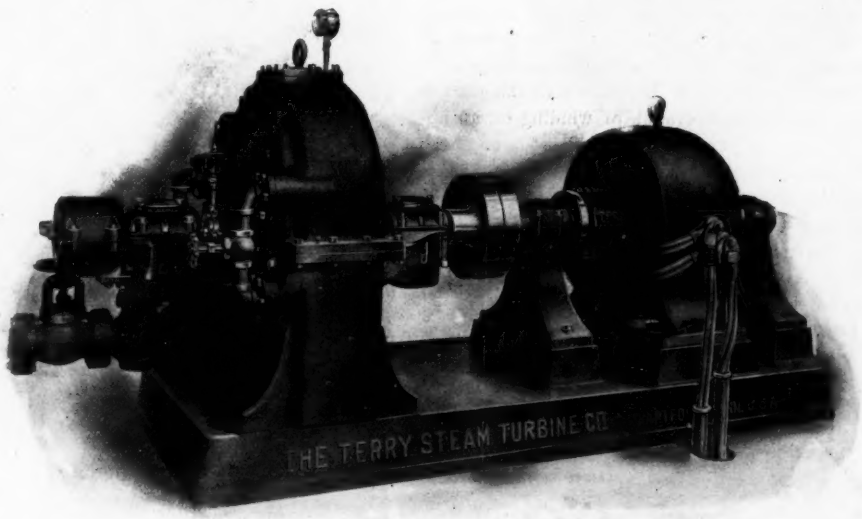
The casing and gearings are parted horizontally, so that by lifting the covers the entire turbine is open for inspection.

The wheel and shaft are of steel, perfectly balanced and tested to safely withstand a speed fifty per cent. above rating. Clearances between wheel and reversing chambers are ample. Because of the low temperature of the jet steam, there is but slight difference between the clearance when the turbine is cold or when the turbine is running. The single wheel and short shaft permit of minimum overall length and maximum rigidity.

The stuffing boxes in the turbine casing are of special construction with ground metal seats, allowing free movement of the shaft while maintaining a perfectly tight joint, without the use of soft packing.

The governor is of the fly ball type, mounted directly on the turbine shaft, and controls a specially constructed mitre throttle valve. As no gearing is employed the necessity of an emergency governor is so slight that none is fitted in the standard design. Furthermore, should the main governor spring break the governor valve would instantly close. A maximum speed variation of 2 per cent. is guaranteed when desired.

Ring lubrication only is employed for main bearings. The small load on the bearings due to the light weight of rotor, and the slow surface speed due to the low revolutions bring these bearings well within the safe limits for this simple reliable type. Bearings are supported by brackets from the turbine casing. In the smaller sizes they are made in one piece of best grade phosphor bronze, while in the large sizes they have a bearing shell lined with babbitt metal.



THE TERRY CONDENSING TURBINE.

For condensing service the two stage turbine is used for all except the smaller sizes where the single stage is supplied. After the steam is passed through the high pressure stage it enters the second stage through nozzles and reversing chambers arranged similarly to those in the first stage. As illustrated in the sectional view, the distance between the bearings of this turbine is so small that troubles due to whipping of shaft, etc., are negligable.

Low pressure turbines to utilize the exhaust steam from non-condensing engines may be effectively installed. As the energy in steam expanded from atmospheric pressure to 28 inches is almost equal to that in the same steam expanding from 150 pounds to atmosphere, the saving resulting in use of such a Turbine is evident.

TURBINE GENERATOR SETS.

For direct connected sets up to and including 300 K.W. the Terry Steam turbine has proven very successful, the low speeds eliminating commutating troubles usually found on direct-current turbine generators. The regulation is as close as obtained in the best engine practice and fluctuating loads are easily handled.

Generating sets for both alternating and direct-current are supplied in standard sizes from 5 to 300 K.W. for condensing or non-condensing service.

CENTRIFUGAL PUMPING UNITS.

The Terry turbine has been successfully applied during the last four years, for driving centrifugal pumps of single and multiple stage. The range of conditions in this service varies from large volumes of water pumped against low heads, such as circulating water for condensers, or for irrigation, up to high head work such as boiler feed or fire service, where the turbine runs at high speed driving a multiple stage pump.

The reliability and entire freedom from shut downs due to accidents, repairs or fitting new packing, have placed the Terry turbine pumping units in a class by themselves.

The turbine has also been applied extensively to centrifugal wet vacuum pumps on hot well service.

GAS WORKS BLOWERS AND MECHANICAL DRAFT.

In gas works the Terry turbine has been very successfully introduced for driving gas blowers in pressures ranging up to 28 inches. The low speed of this turbine permits of coupling direct to the blower shaft without gears. The turbine and blower are mounted on the same rigid cast iron base plate. These sets have been installed in gas plants throughout the country as for condensing and non-condensing service.

Other applications of the turbine-driven blower, have proven successful for forced draft on shipboard, replacing high speed engines. Light weight, absence from vibration and compactness of these sets together with low steam consumption and freedom of any oil in the exhaust steam, recommend them especially for marine work.

TURBINES FOR USE BELTED.

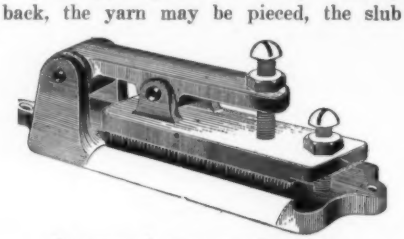
On account of the comparatively low speed of this turbine, it can be used belted to line shafting or machine, or in some cases, where reduction of speed is too great a counter shaft is used.

Inquiries about anything pertaining to the textile business will be cheerfully answered by COTTON.

JOHN D. STREET, of the Cell Drier Machine Co., Taunton, Mass., has just returned from a seven-weeks trip on the other side. The object of his visit was to make arrangements for the building of Cell Driers in Europe. He reports that the general cotton trade is in very bad condition. Spinners and weavers are very much discouraged at the outlook, while machine shops are running practically on half time.

DEVICE FOR IMPROVING THE YARN.

The requirements in nearly all branches of trade are becoming more and more exacting, making still more applicable the popular adage that improvement is the order of the age. Improvement in yarn is a question of much importance especially to the readers of "COTTON;" namely, those who make cotton yarn and who use it. The little device illustrated herewith improves yarn in that it catches slubs and bunches. There have been introduced many devices for this purpose but few of them possess as many advantages as this one. It consists essentially of a metal base having a plane surface over which the yarn is allowed to pass during the operation of winding on an upright winder. Over the yarn is suspended a lot of sharp pointed wires with the points directed downward and in the direction from which the yarn is coming. These points may be adjusted for height over the plane surface so that provision may be made for different thicknesses of yarn. When the yarn is free from bunches or slubs it passes under the points without being disturbed, but when such defects are present the sharp points spear them and break the yarn. The upper part of the slub catcher may be thrown back, the yarn may be pieced, the slub catcher



CATCHES SLUBS AND BUNCHES.

closed again and the yarn started running, which it will continue to do until another enlargement comes along which in its turn will be caught. This device is manufactured and sold by Tompkins Bros. Company, knitting machine manufacturers and engineers, Troy, N. Y.

A BUSINESS BASED ON ENERGY, FAIR DEALING AND PROMPT SERVICE.

The Stuart-Howland Company, of Boston, has recently moved into its new store and offices Nos. 1, 2 and 3 Winthrop Square and 12 to 36 Otis Street.

This building is located in the heart of the busiest business section of Boston. It contains about 13,000 sq. ft. on each floor, and has been fitted out in the most up-to-date manner for storing and handling electrical merchandise at the lowest possible cost. It has a street frontage of over 325 feet, and as the entire front walls are of plate glass—except the stone piers which are about two feet square—the entire floor area is unusually well lighted.

The general accounting and private offices occupy the entire Otis Street side of the ground floor while the sales offices take up the Winthrop Square side, running back about fifty feet from the street. All of these offices are of quartered oak, and are especially light and attractive. Every foot of space seems to be occupied with desks, aisles, etc., and every desk constantly in use during business hours by the largs corps of department managers, assistants, bookkeepers, stenographers, etc., and each apparently deeply interested in his particular part.

The whole layout presents a spectacle of unusual activity.

The receiving and shipping departments are both in the basement, which is very high studded, light and com-

STUART-HOWLAND CO.'S BUILDING.

modious. All goods are either received by the Otis Street elevator or by an immense slide on the Winthrop Square side, while all shipments are sent to the street either by the front or back freight elevators, the latter running from the bottom to the top of the building.

Practically all the back walls are covered with shelves and bins which alone carry between four and five thousand barrels of goods of many varieties in broken packages, while boxes and barrels holding standard packages are piled from floor to ceiling in tiers with aisles between making everything in this immense stock available at will.

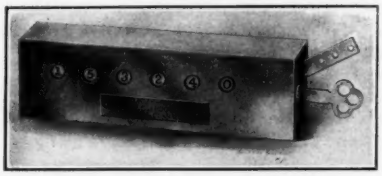
The Stuart-Howland Company started in business only nine years ago and its growth has been rapid and constant. Even last year, which was so extremely dull in this line of business throughout the United States, its sales ran considerably ahead of any previous year. This growth has not been due to any new methods but rather to energy, fair dealing and prompt service.

Its management is quite optimistic of the early return of business prosperity and in proof of this has recently added six new men to its already large force of salesmen on the road.

It has many selling agencies where manufacturers market their entire product through this Company. Among them is the Standard Magnet Wire Co., of Claremont, N. H., whose product is well and favorably known throughout the United States and Canada.

THE COUNTER THAT WILL DO ITS OWN COUNT.

The accompanying illustration is one of the counters made by the C. J. Root Co., Bristol, Conn. This company makes various kinds of counters suitable for any kind of a machine where the measure or count of the day's output is desired. These counters are well and substantially made, artistically finished, and aside from their practical value are an ornament to any machine. They can readily be set at naught or at any desired number, and will repeat

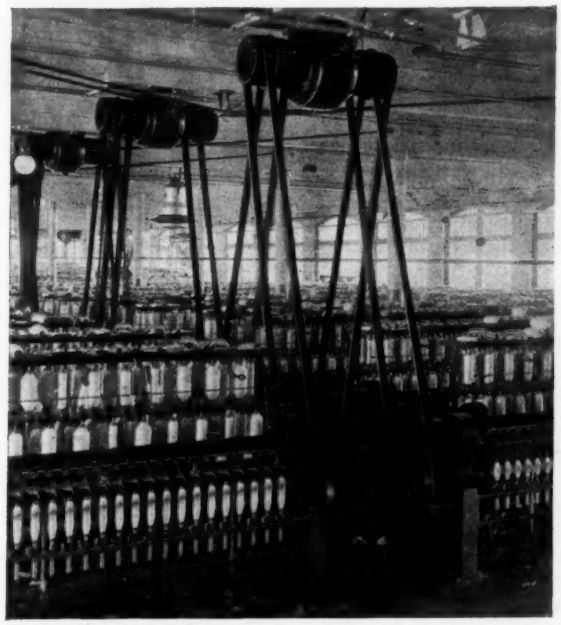


THE ROOT COUNTER CLOSED.

automatically after limit of capacity is reached, without further setting. They are especially used by textile manufacturers, who have indorsed them because of the uses to which they can be put. These counters can be furnished, if desired, with a bell to ring at specified intervals, also by special arrangement to count by dozens, gross, etc. They are made also to count the number of yards or picks as desired.

ELECTRICALLY DRIVEN MACHINES.

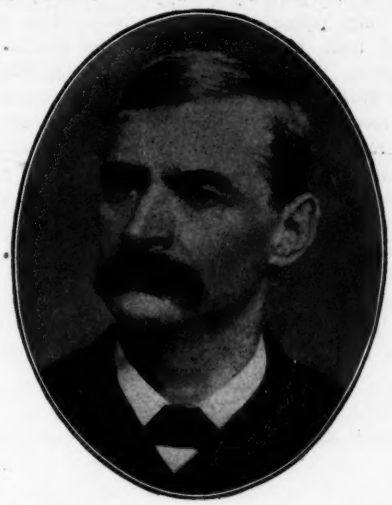
The accompanying illustration appeared in our April issue on page 219, in connection with an article written by J. K. W. Davenport, entitled "Electrically Driven Cot-



SPINNING MACHINES DRIVEN BY ALLIS-CHALMERS CO.'S MOTORS.

ton Mills." The photograph from which this illustration was made was sent us, by mistake, as showing Crocker-Wheeler Co's. motors, while the motors are those manufactured by the Allis-Chalmers Co., Milwaukee, Wis.

BARCLAY M. DENNEY died March 28th. He was born in 1842 at Coatsville, Pa. In 1861 he enlisted in the first regiment, Pennsylvania cavalry, and served until March 25, 1863. From that time he held the position as foreman



BARCLAY M. DENNEY.

for James L. Branson, manufacturer of knitting machinery, Philadelphia, until 1888, when he enlisted into a copartnership with Henry Brinton in the manufacture of circular hosiery knitting machinery, and remained a member of the firm of Brinton and Denney until March 15, 1895. Shortly thereafter he was given charge of the Philadelphia office of the Mayo Knitting Machine & Needle Co., which position he held until he resigned in November, 1905, to become the Philadelphia representative of the Geo. D. Mayo Machine Co., which connection he retained to the time of his decease. He was an inventor of much ability, bringing out a number of knitting machines and improvements.

"ENGINEER'S MANUAL—THE REEVES VARIABLE SPEED TRANSMISSION." This is the title of a manual just published by the Reeves Pulley Co., Columbus, Ind., comprising a complete compilation of technical data, tables and cuts descriptive of this transmission. The manual was compiled primarily for the use of the salesman, engineer and superintendent who has to do directly with the erection and operation of the machine, but will be found of equal value to the prospective purchaser and the engineer who wishes to obtain a detailed idea of the construction and the transmission. The manual, bound in leather, will be sent anywhere upon receipt of $1.00, or bound in heavy paper, will be sent to any reputable engineer or manufacturer upon application to the compilers and publishers.

B. F. STURTEVANT CO., Boston, Mass., works at Hyde Park, Mass. This company has issued two interesting brochures, one relating to "gas boosters" for overcoming low pressure and maintaining a regular pressure on the low level; and one on "ventilation," for removing hot air from a room by means of a fan of the multivane type, the latest development in fans, whether large or small.

AUTOMATIC THIN PLACE PREVENTER: Clayton & Bentley Co., Atlanta, Ga., write us that in "the May issue of COTTON we published a list of 62 mills which were using our appliance—some with all their automatic looms equipped, and others partially equipped. During May we have also fully equipped two other mills which had not even placed their 'first order" at the time the May issue went to press. We have also received during May a repeat order from another mill which had been running 824 of our 'Preventers' for eighteen or twenty months. We have also received a nice starting order from another of the very large mills in the South. The first two mills referred to are Columbia Mfg. Co., Ramseur, N. C., and Meridian Cotton Mills, Meridian, Miss. The second two mills referred to are Henderson Cotton Mills, Henderson, N. C., and Roanoke Mills Co., Roanoke Rapids, N. C. The repeat order mill is Pacolet Mfg. Co., New Holland, Ga. And the last mill referred to is Merrimack Mfg. Co., Huntsville, Ala. We therefore now have 65 mills on our sold list.

S. MORGAN SMITH CO., York, Pa., has opened an office in Chicago. J. C. Temple, a well known hydraulic engineer who has been engaged in the water-wheel business for many years, has charge of the office and will be pleased to hear from people west of Pittsburg who are contemplating installing turbine wheels.

MURALT & CO., New York, have opened a branch office in the Temple Court Building, corner Bay and Richmond Streets, Toronto, Ontario. J. Engh, who has been prominently connected with this company for many years, will be in charge as manager.

CELL DRIER MACHINE CO., Taunton, Mass. The cell drier of this company which caused so much attention at the textile exhibition in Boston, last month, was sold to the Waltham Bleachery, Waltham, Mass. This is a duplicate order. The set of slasher cells also exhibited was sold to the Fulton Bag & Cotton Mills, Atlanta, Georgia. This is also a repeat order. Among the many orders on hand, one is for the Farr Alpaca Company. This concern has been operating three cell driers in the past—this will make the fourth. Another cell drier that is being built is for pulp or strawboard. The general use of this drying apparatus as an all-round economizer is very gratifying.

JOS. DIXON CRUCIBLE COMPANY, Jersey City, N. J. "Valuable Graphite Products" is the title of a pocket edition of a general catalogue, published by this company, giving a list of special products such as crucible, facings, lubricating graphites, greases, pencils, protective paints, etc., with brief descriptions and prices. The May number of this Company's publication, *"Graphite,"* contains many interesting features such as the preventing of corrosion of steam machinery, roll neck lubrication, and how pencils are made. All of this literature will be sent free upon application.

FACTORY ORGANIZATION AND COSTS. This is the title of an exceedingly valuable work dealing with all the known methods of paying wages, explaining by analysis and illustration the difference between the various methods and the effects on the employees, employers and production; giving a complete, simple and concise treatise on the elements of cost, so written that the student as well as the practical business man will be able to comprehend and gain a complete knowledge of cost principles; giving a collection of system forms, all in actual use in manufacturing plants, and explained in a simple and comprehensive manner. The author is J. Lee Nicholson, president of the J. Lee Nicholson Co., auditors and accountants, established for twenty years, and president and cost specialist of the American Cost Accounting Co. The book can be obtained of the COTTON PUBLISHING CO., Atlanta, Ga., Price $12.50.

HUSSONG DYEING MACHINE CO., Groveville, N. J. The Harrison Yarn & Dyeing Co., Pawtucket, R. I., has six of the machines made by Hussong company in operation principally for sulphur black, and it is reported that they are giving the best of satisfaction. The labor cost is lower and the spooling production is better since these machines were put in use. The H. H. Brown & Sons Co., Paterson, N. J., has been using the Hussong dyeing machines with entire satisfaction. The Hulton Dyeing & Finishing Co., Philadelphia, says that it has been using the Hussong dyeing machine for sulphur colors and think for this class of work it is one of the best machines on the market to-day.

EXHAUST FANS. A publication of peculiar interest at this season is bulletin No. 112, issued by the Crocker-Wheeler Company, Ampere, N. J., on exhaust fans. A feature which is emphasized here is the variety of service to which these fans have been adapted. Their compactness, noiselessness and the little attention required for their maintenance.

THE J. H. WILLIAMS CO., Utica, N. Y. This company is now constructing in Massachusetts a larger plant which will be equipped with new and improved machinery in addition to what the company is now operating. The former policies of this company will be continued under the management of Mr. Ralph O'Brien who has been connected with the company for several years.

A GREAT WATER POWER.

The great dam some 1,500 feet long, across the Great PeeDee River, at Blewlett's Falls, N. C., near Rockingham, will form above it a lake extending up the river nearly 8 miles and in some places several miles wide, containing a total area of about 2,500 acres.

The dam gives a fall of 45 to 50 feet. Electric power available at these falls will be all utilized, undoubtedly, within a distance of approximately 50 miles.

It may mean the operation of some 100 cotton mills, with an aggregate equipment of approximately 1,000,000 spindles.

The typography of the neighborhood permits inexpensive transportation facilities and unusually low necessary cost of construction of industrial buildings.

How to spin to an extreme is the first consideration—one quickly finds the ordinary woolen process carding and spinning insufficient.